A HABITAT CONSERVATION PLAN

SUBMITTED BY

NORTHERN INDIANA PUBLIC SERVICE COMPANY

&

INDIANA - AMERICAN WATER COMPANY, INC.

AS PART OF A JOINT

SECTION 10(a)(1)(B) INCIDENTAL TAKE PERMIT

APPLICATION

FOR THE

FEDERALLY ENDANGERED
KARNER BLUE BUTTERFLY

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Prepared by:

Brian Kortum
Natural Resources Specialist
NiSource, Inc.

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Thanks to all who assisted in the creation of this HCP. Special thanks to: Paul Labus, Liz McCloskey, John Shuey, Jim Barnhart, Jason Lietz, and Brian Stage. Very Special thanks to Tracy Elzemeyer at Indiana American Water Company.

NIPSCO Habitat Conservation Plan (HCP)

Executive Summary:

NIPSCO

This document pertains to certain gas and electric Rights of Way (ROW) owned and operated by the Northern Indiana Public Service Company, and one easement owned by the Indiana-American Water Company, Inc (INAWC) hosting electrical facilities, which are maintained by NIPSCO. These facilities are vital to the economy and infrastructure of the region, delivering vital electric, gas, and water resources throughout Northwest Indiana.

NIPSCO with headquarters in Merrillville, Ind., is one of the 10 energy distribution companies of NiSource Inc. (NYSE: NI). With nearly 700,000 natural gas customers and 430,000 electric customers across the northern third of Indiana, NIPSCO is the largest natural gas distribution company, and the second largest electric distribution company, in the state. NiSource distribution companies serve 3.7 million natural gas and electric customers primarily in nine states.

INAWC is part of American Water. American Water, a part of RWE's water division, serves 20 million customers in 27 states, 4 Canadian provinces, Puerto Rico, and South American. Over 8,000 employees provide water, wastewater and other related services. RWE's water division is the third largest water and wastewater service company in the world.

Current Species Status: The Karner blue butterfly (KBB), *Lycaeides melissa samuelis* Nabokov (Lepidopetera: Lycaenidae) formerly occurring in a band extending across 12 states from Minnesota to Maine and in the Province of Ontario, Canada, now only occurs in the seven states of Minnesota, Wisconsin, Indiana, Michigan, New, York, New Hampshire, and Ohio. In 1998, it was reintroduced to Ohio. Wisconsin and Michigan support the greatest number of Karner blue butterflies and butterfly sites. The majority of the populations in the remaining states are small and several are at risk of extinction from habitat degradation or loss. Based on the decline of the Karner blue across its historic range, it was listed as endangered in 1992.[1]

Habitat Requirements and Limiting Factors: The Karner blue butterfly is dependent on wild lupine, *Lupinus perennis* L. (Fabaceae), its only known larval food plant, and on nectar plants. These plants historically occurred in savanna and barrens habitats typified by dry sandy soil, and now occur in remnants of these habitats, as well as other locations such as roadsides, military bases, and some forestlands. The primary limiting factors are loss of habitat through development, and canopy closure (succession) without a concomitant restoration of habitat. A shifting geographic mosaic that provides a balance between closed and open-canopy habitats is essential for the maintenance of large viable populations of Karner blue butterflies. [1]

Karner blue butterflies and Northern Indiana Public Service Company: In 1993, the United States Fish and Wildlife Service informed NIPSCO that the Karner blue butterfly (*Lycaeides melissa samuelis*) was present on property owned in Gary, Indiana. The area of concern is the Miller ROW owned by NIPSCO for locating an overhead electrical transmission line. Associated with the butterfly were several potential habitat sites containing wild lupine and various other nectar plants. Since that time, populations of the butterfly were also discovered on the company's Aetna ROW and Stagecoach Rd. ROW, both containing overhead electrical transmission lines. Several potential sites were present on NIPSCO properties.

Current and potential Karner blue butterfly habitat on NIPSCO properties consists of utility ROW, surrounded by adjacent oak savannas and lakeshore dunes. Past ROW maintenance included mowing every six years, which benefited the butterflies by acting as the disturbance necessary to restart succession and maintain the open areas that lupine needs to thrive. This maintenance can be performed seasonally in order to avoid or limit contact with lupine and Karner blue butterflies, which are active during periods between May and August. Emergency maintenance or repairs of the electric transmission lines, though, may be required at any time of the year, creating a potential operational conflict and a greater risk of butterfly disturbance or destruction due to vehicular or pedestrian traffic.

Since the initial discovery, NIPSCO has worked cooperatively with the U.S. Fish & Wildlife Service (USFWS), The Nature Conservancy (TNC), the Indiana Dunes National Lakeshore (IDNL), the Indiana Department of Natural Resources (IDNR) and others to maintain conditions favorable for successful butterfly production. These properties are some of the few sites in Indiana where the Karner blue butterfly is known to exist. NIPSCO also has facilities located on an easement in Ogden Dunes that hosts the Karner blue butterfly. This corridor is owned by INAWC, which also has a water line located underground on this ROW.

This HCP will describe methods that NIPSCO and INAWC will undertake to continue to assist in the monitoring and maintenance of favorable Karner blue butterfly habitat in appropriate areas on company properties. Also, it will describe the development of favorable Karner blue butterfly habitat in the Miller Substation savanna, which is immediately adjacent to the Miller ROW. This area will be set aside as a mitigation site for potential impacts on the plan ROW.

This HCP and incidental take permit is being sought to reduce NIPSCO's and INAWC's liability under the Endangered Species Act in the event of an incidental take of Karner blue butterfly(s) as a result of NIPSCO's operation and maintenance of the Aetna, Miller and Stagecoach Rd. ROWs, as well as the electric facilities located on the Ogden Dunes INAWC easement. Furthermore, this HCP and incidental take permit is being sought to reduce INAWC's liability

under the ESA in the event an incidental take of KBB as a result of INAWC's operation and maintenance of the water facilities located on the Ogden Dunes ROW. NIPSCO and INAWC request that the incidental take permit be in effect for a period of ten (25) years, at which time they will reevaluate the plan. This will provide the opportunity to incorporate new ideas and methods and to address issues that have developed during the term of the previous plan.

1.0 Introduction

This Document provides the required application components for section 10(a)(1)(B), incidental take permit application, a Habitat Conservation Plan (HCP), and application Form 3-200. The duration requested for this section 10(a)(1)(B) permit is for twenty five (25) years from the date of issuance. This allows NIPSCO and INAWC to "take" the KBB within the geographical boundaries identified within this HCP over that period; it will also require NIPSCO and INAWC to follow the provisions of this HCP in order to comply with the permit requirements.

Since it is difficult to take into account the population of Karner Blue Butterflies and the potential take of the KBB, and since the KBB is tied directly to the wild lupine plant, this plan will focus on various habitat levels. KBB habitat on ROW covered by this HCP will fit into one of three categories. They are: known habitat, known occupied habitat, and potential habitat, and will be defined in section 2.2.1 of this plan. Wild lupine surveys will be done to develop a baseline, which will be used to determine HCP compliance.

1.1 Overview and Background

This section introduces the NIPSCO Karner Blue Butterfly Habitat Conservation Plan (HCP). General information is provided on endangered species laws, the Karner blue butterfly and their relationships. An introduction to the regulatory framework for the NIPSCO Karner Blue Butterfly HCP is provided. In addition, the purpose and need for the HCP and an incidental take permit are documented.

1.2 Regulatory and Legal Framework for Plan

1.2.1 The Endangered Species Act

The U.S. Congress enacted the Endangered Species Act (ESA) in 1973 to protect plant and animal species that are in danger of, or threatened with, extinction. The U.S. Fish and Wildlife Service (USFWS) is responsible for implementing the ESA for those species under its jurisdiction. Section 9 of the ESA, its primary species protection provision, generally

prohibits the taking of federally listed threatened or endangered fish and wildlife species.

"Take" relative to the KBB is the act of killing, harming, collecting, capturing, or harassing the species. This includes all life stages of the KBB. In some instances, modifying or disturbing the habitat of a listed species to the point that the ecological processes of the species are adversely affected can also constitute take, because it harms the species. These processes include feeding, breeding and sheltering.

Before issuing an incidental take permit, the USFWS must ensure that all requirements of section 10(a)(1)(B) of the ESA are met. After evaluating the requirements, the USFWS may:

- deny the permit,
- issue a permit based on implementation of the HCP as received, or
- issue a permit conditioned on implementation of the HCP and other measures specified by USFWS.

Under section 7(a)(2) of the ESA, issuance of an incidental take permit by the USFWS is a federal action subject to section 7 compliance. Therefore, a USFWS internal section 7 consultation must be conducted to insure that issuance of the permit will not jeopardize the continued existence of the Karner blue butterfly.

1.2.2 The ESA and Non-federal Lands.

The ESA establishes two processes that allow for the limited take of federally listed species on non-federal lands, provided measures are taken to conserve affected species. These processes are the formal section 7-consultation process [section 7(a)(2), ESA] and the incidental take permit process [section 10(a)(1)(B), ESA].

Section 7(a)(2) requires federal agencies to consult with the USFWS to insure that any action authorized, funded, or carried out by such an agency is not likely to jeopardize the continued existence of any

endangered or threatened species or result in the destruction or adverse modification of critical habitat. Federal actions that result in take are subject to a formal consultation process, the conclusion of which is the issuance by the USFWS of a Biological Opinion and an Incidental Take Statement. The Incidental Take Statement authorizes a defined amount of take and the Biological Opinion establishes reasonable and prudent measures to minimize harm to the species. The consultation process under section 7 can affect non-federal landowners if a project or activity on non-federal lands requires some form of federal approval, such as a permit, or involves the expenditure of federal funds.

Section 10(a)(1)(B) provides a mechanism to address situations in which non-federal projects or activities not requiring federal authorization or funding are in potential conflict with the protection of a listed species. Under section 10(a)(1)(B), an Incidental Take Permit (ITP) allows for the take of federally-listed species on non-federal lands where their presence interferes with land use activities that would otherwise be legal, as long as certain conditions are met. The ESA specifies those conditions as follows:

- The taking will be incidental
- the applicant will minimize and mitigate the impacts of such takings
- the applicant assures that adequate funding for the plan will be provided
- the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild
- any additional measure, assigned by the Secretary, will be met.

To obtain an ITP, the non-federal landowner must develop a habitat conservation plan (HCP). An HCP is a formal plan that specifies:

- the impact to the species which will likely result from the taking
- what steps the applicant will take to minimize and mitigate the impact and the funding that will be available to implement such steps
- what alternative actions to the taking were considered and the reasons why the alternative actions were not used
- other measures that the Secretary may require as necessary or appropriate for the purposes of the plan. [2]

1.2.3 Purpose and Need

The purpose of the proposed federal action is the issuance of a permit pursuant to the provisions of section 10(a)(1)(B) of the ESA, which would authorize the incidental take of Karner blue butterflies on selected NIPSCO and INAWC ROW for a period of 25 years.

The purpose of the proposed action on the part of NIPSCO and INAWC is preparation and implementation of an HCP which will contribute to the conservation of the Karner blue butterfly and its habitat, while allowing planned management and maintenance activities to continue.

Due to Karner blue butterfly presence, certain management practices that were legal prior to federal listing in 1992 are no longer permissible because of the possibility of incidental take. However, because of the intermittent distribution and disturbance-dependence of the Karner blue butterfly and its host plant, wild lupine, it is likely that such management activities, specifically those that result in disturbance (i.e. Vegetation Management) could improve the conditions to support Karner blue butterflies. Despite the short-term incidental take of some individual butterflies, this could potentially increase the chances of Karner blue butterfly population viability over the long-term.

The USFWS is required to respond to all applicants seeking permits, which would allow the incidental take of listed species. It is necessary for the USFWS to assure that the HCP and the implementing agreement submitted by the applicant comply with the provisions of the ESA with regard to incidental taking [50 CFR 17.22 (b)(2)] prior to issuance of a permit for the take of Karner blue butterflies. [2]

1.3 Plan Area

The plan area consists approximately 86 acres made up of three distinct segments of NIPSCO rights-of-way (ROWs): Aetna ROW, Miller ROW, and Stagecoach Road ROW, and one easement in Ogden Dunes, owned by INAWC. (Appendix A, Figure 1) In 2004, JF New and Associates performed a habitat survey on these 86 acres. During that survey, the total amount of Wild Lupine found on these ROW was 4.244 Acres. This establishes the base line habitat level for this plan.

1.3.1 Aetna ROW

The Aetna ROW (see Appendix A, figure 2), located in Section 12, Township 36 North, Range 8 West, Lake County, Indiana at the NIPSCO Aetna location, lies in Gary, Indiana, approximately two miles from Lake Michigan. The total acreage at the Aetna location is just less than 15, however the area is divided into 2 separate locations, labeled 1a & 1b on figure 2, with 1a being inside the fenced complex and 1b south of 15th Avenue. (Figure 2) The area within the fenced complex (1a) includes a ROW 300 feet by 1000 feet. This 6.8-acre area extends from 15th Avenue, which is the south boundary of the fenced Aetna Complex, north to an electrical transmission substation within the complex. The west ROW border contains sparsely wooded areas, and the east ROW border is partly residential, partly wooded area. The majority of the ROW is a mix of dune, sand prairie, and marsh. The northern portion of the ROW consists of high dunes. These dunes, although nearly devoid of lupine, are home to numerous potential nectar plants, including columbine, Rudbeckia, goat's rue, spiderwort, phlox, coreopsis, sand cress, various asters, and prickly pear cactus. The west central portion of the ROW contains a low, marshy area, relatively degraded and thick with Phragmites, a non-native reed. The east central portion of the ROW is a relatively diverse sand prairie. Scattered patches of lupine are found in this area, mostly in the center of the ROW near the border with the marshy area.

Immediately south of the marshy area exists a small, relatively diverse area, including numerous lupine patches mixed with a diverse array of other wildflowers. This small area lies directly east of the NIPSCO Communications building. The southern portion of the six acres is heavily degraded and vegetation consists primarily of undesirable and invasive species including downy broam (*Bromus tectorum*), Canada thistle (*Cirsium arvense*), henbit (*Lamium amplexicaule*), honeysuckle (*Lonicera* spp.) Kentucky blue grass (*Poa pratensis*), and glossy buckthorn (*rhamnus frangula*). [3] During the 2004 baseline survey conducted by JF New and associates, eight wild lupine populations were observed and mapped on the Aetna ROW A, totaling .476. Karner Blue butterfly nectar species such as dogbane and sand cress among others were also found.

Area 1b is located south of 15th Avenue, is a triangular shaped area consisting of approximately 8 acres. It has similar characteristics to the area to the north, however no wild lupine has been observed in this area. A portion of the area contains sparse woods containing mostly cottonwood trees. During the 2004 baseline survey conducted by JF New and Associates, 0 acres of wild lupine were mapped in section 1b. Although this site does not contain wild lupine site, characteristics are conducive to wild lupine growth.

A complete report for this ROW can be found in the JF New 2004 Baseline Monitoring Report (Appendix B).

The ROW consists of 4 rows of lattice towers with each tower supporting 2 138KV circuits. There are also 4 wood pole lines consisting of three 69KV and three 34 KV lines.

In Aetna area 1a, there are 2 12-inch steel natural gas pipelines on the eastern edge of the ROW. In area 1b there are 3 natural gas pipelines, an 8-inch, 22-inch and 30-inch. All of these lines are on the eastern side of the area.

In consultation with the U.S. FWS, this ROW was mowed in 1999 and herbicide was applied in 2000, with a follow up spot treatment in September 2002.

1.3.2 Miller ROW

Located in Section 1, Township 36 North, Range 8 West, Lake County, Indiana, just to the North of Aetna, but is

separated by the Dunes Highway and by 2 sets of railroad tracks. (Appendix A, Figure 2)

The Miller ROW is dune and swale topography and therefore has several wetlands, although navigation around them is not difficult. The total acreage at Miller location covered by this HCP is just less than 37 acres.

The Miller ROW location consists of a 0.75-mile section of right-of-way. In this ROW are 2 rows of lattice tower structures carrying 4 -138 KV circuits to the south of the substation and a single row of lattice tower structures carrying 2 138 KV circuits to the north of the substation.

This plan area also consists of a 12.85-acre wood/ wetland area. This area includes 3.85 acres of wetlands and 9 acres of uplands. This site will be known as the “Mitigation Area”. This area currently supports .406 acres of Wild Lupine.

The ROW runs north and south and is transected several times by RR tracks at differing intervals dividing the area into 3 sections, labeled 2a, 2b & 2c on figure 2.

Area 2a has 4 unequal sides. The North side is 705 feet, the East is 1742 feet, the south is 730 feet, and the west is 1648 feet. The total area is 27 acres, however a gravel-covered substation 440 feet by 430 feet, or 4.35 acres, is not included in the plan area. This fenced substation area is located in the North East corner of this section. The area included in the plan is 22.65 acres, and consist of 9.8 acres of ROW and 12.85 acres of mitigation area. During the 2004 baseline survey conducted by JF New and Associates, .602 acres of wild lupine were mapped on the ROW portion of section 2a, and as stated above, .406 acres was located in the mitigation area, for a total of 1.08 acres of wild lupine in section 2a.

Section 2b is to the north between 2 sets of RR tracks and includes an undeveloped old access road used when necessary by the Dunes National Lakeshore to reach their property east and west of the ROW. The area consists of ROW 300 feet wide by 1200 feet long (8.25 Acres). During the 2004 baseline survey conducted by JF New and Associates, 0.443 acres of wild lupine were mapped in section 2b.

Section 2c is the furthest North section of this ROW before it turns west, and enters US Steel's Gary Works, at which point there is no KBB habitat associated with the ROW. This area is 350 feet wide by 800 feet long (6.42 Acres). During the 2004 baseline survey conducted by JF New and Associates, 1.278 acres of wild lupine were mapped in section 2c.

Bordering the ROW to the southwest is remnant black oak savanna known as the Gary Enterprise Zone. The Miller Woods section of the Indiana Dunes National Lakeshore borders the remainder of the ROW. The Miller Woods area as well as the GEZ is noted for its dune and swale characteristics, with the dune areas being black oak savanna habitat and the swales wetland. The dunes and swales are oriented somewhat east and west; therefore the ROW crosses this dune and swale topography several times. The plan site lies in Gary, Indiana, less than one mile from Lake Michigan. (Appendix A , Figure 2)

In the mid 1990's, Karner blue butterflies were confirmed to exist on the Miller ROW. In 1998, the USFWS marked the extent of lupine and documented the presence of nectar plants on the ROW. Sightings of Karner blue butterflies were also noted (E. McCloskey, pers. comm.). NIPSCO hired JF New and Associates to conduct a wild lupine and nectar plant survey using GPS along the ROW in 2004. JF New also conducted presence/absence surveys for the Karner blue during both first and second flights in 2004 using GPS. See appendix B for survey results.

1.3.3 **Stagecoach Road ROW**:

The Stagecoach Road ROW is located in Sections 2 & 3 Township 36 North, Range 7 West, and Sections 35 & 36 Township 37 North, Range 7 West, Porter County, Indiana, adjacent to the Coulter Nature Preserve and The Indiana Dunes National Lakeshore, just to the south of Ogden Dunes. (Appendix A , Figure 3) This ROW consists of 2 rows of lattice tower structures comprised of 4-138 KV electric lines between County Line Road and the third crossing of Stage Coach Road. At this point it is joined by an additional lattice tower structure that carries a single 345 KV circuit, and continues to the east until it crosses Burns Ditch. Included in this ROW is a 22" natural gas pipeline. This section of ROW is less than two miles from Lake Michigan, and exhibits oak savanna characteristics. Karner

blue butterflies were identified on this ROW in 1997. During surveys performed by the U.S. Fish and Wildlife in 1998, Karner blues were present and the extent of lupine was marked (E. McCloskey, pers. comm.). In 2001, surveys were performed along the westernmost portion of the ROW, adjacent to the Coulter Preserve managed by the Shirley Heinze Environmental Fund (SHEF) (Figure 3). Lupine was recorded in the same two general areas along this segment of the ROW as noted during the 1998 surveys, and both male and female Karners were found in the vicinity of those two lupine areas.

The portion of this ROW that is covered by the plan is divided into 3 sections. The west section, 3a is 14.7 acres and starts at the first crossing of Stagecoach Road east of County Line Road and heads Northeast for 4,000 feet. During the 2004 baseline survey conducted by JF New and Associates, 0.274 acres of wild lupine were mapped in section 3a. This section ends where the ROW crosses Stagecoach Road for the third time. At this point Stagecoach Road will be bordered on the east by a farm field. The middle 4.4 acre section, 3b, is 1,200 feet long and bordered to the east and west by the fourth and fifth crossings of Stagecoach Road, which winds around a sand dune area. During the 2004 baseline survey conducted by JF New and associates, 0.123 acres of wild lupine were mapped in section 3b. The eastern 12.8-acre section, 3c, starts about 3000 feet past the middle section and continues 3500 feet until it reaches Burns Ditch. During the 2004 baseline survey conducted by JF New and Associates, 0.086 acres of wild lupine were mapped in section 3c. The total distance of Stagecoach Road ROW covered in this plan is 8700 feet and the width is 160 feet, totaling almost 32 acres (0.483acres of wild lupine). More information can be found in the JF New 2004 Baseline Monitoring Report (Appendix B).

1.3.4 Ogden Dunes Easement

Located in Section 35 Township 37 North, Range 7 West, Porter County Indiana. The 2-acre easement begins at a point west of Hillcrest Drive, which is the entrance road to Ogden Dunes. (Appendix A, Figure 3) This easement contains a 69 KV circuit on wood poles and runs due west along the south line of Ogden Dunes, with National Lakeshore property on its south side. At the west edge of Ogden Dunes, it turns north and goes to the water treatment

plant, which is located in the southwest corner of the town. INAWC owns this ROW, which includes a 36-inch water main. The electric line is maintained by NIPSCO. During the 2004 baseline survey conducted by JF New and Associates, 0.556 acres of Wild Lupine was recorded.

Location	2004 Acreage
Aetna A	0.476
Aetna B	0
Miller A	0.602
Miller B	0.443
Miller C	1.278
Miller Mitigation	0.406
Stagecoach A	0.274
Stagecoach B	0.123
Stagecoach C	0.086
Ogden Dunes	0.556
Total	**4.244**

1.4 Species to be Covered by Permit

1.4.1 The Karner Blue Butterfly

The Karner blue butterfly (*Lycaeides melissa samuelis)* (Appendix A, Figure 4) was proposed for federal listing on January 21, 1992 (U.S. Fish and Wildlife Service [USFWS] 1992b), and on December 14, 1992 it was listed as federally endangered range wide (USFWA 1992b). Historically, the Karner blue occurred in 12 states and at several sites in the province of Ontario. It is currently extant in seven states (including Ohio where it was reintroduced in 1998) with the greatest number of occurrences in the western part of its range (Michigan and Wisconsin). It is considered extirpated from five states and the Canadian province of Ontario. The historic habitat of the butterfly was the savanna/barrens ecosystem. Much of these ecosystems have been replaced by other unsuitable habitat, especially in the eastern part, and along the margins of the butterfly's range. The loss of suitable habitat resulted in a decline in Karner blue locations and numbers with some large populations lost, especially in the eastern and central portions of its range. Presently, the Karner blue occupies remnant savanna/barrens habitat and other sites that have historically supported these habitats,

such as silvicultural tracts, rights of way, airports, military bases and utility corridors.

The ecology of the Karner blue butterfly is closely tied to its habitat, which provides food sources and key sub habitats for the butterfly. The larvae feed only on one plant, wild lupine (*Lupinus perennis)*. Adults require nectar sources to survive and lay sufficient eggs. These habitat components are provided by a variety of sites, including savanna/ barrens remnants, silvicultural tracts, rights-of-way, etc. Because these habitat components can be lost to succession, Karner blue butterfly persistence is dependent on disturbance and/or management to renew existing habitat or to create new habitats. The distribution and dynamics of these habitats in the establishment of viable metapopulations of this species forms the ecological basis for this Habitat Conservation Plan.[1]

1.4.2 Habitat / Ecosystem

The physical features that affect Karner blue butterfly habitat vary across its geographic distribution. The western part of the range is subject to greater continentality effects, which include greater annual variation in temperature, lower precipitation, and greater year-to-year variation in precipitation. Average annual precipitation is higher in the eastern part of the range than in the western part of the range. Annual variation in precipitation is generally less than 10 percent of normal in the East, but more variable in the West at 15 percent of normal. In the East, the annual range in temperature is less than 28 degrees Celsius, but in the west the annual range is greater than 28 degrees Celsius. Thus in the west, Karner blue habitat will be subjected more frequently to drought and temperature extremes, such as cool springs or hot summers, than in the East.

Throughout its range, the Karner blue butterfly was historically associated with native barrens and savanna ecosystems, but it is now associated with remnant barrens and savannas, highway and power line rights-of-way, gaps within forest stands, young forest stands, forest roads and trails, airports, and military bases that occur on the landscapes previously occupied by native barrens and savannas. Almost all of these contemporary habitats can be described as having a broken or scattered tree canopy that varies within the habitats from 0 to between 50 and 80 percent canopy cover, with grasses and forbs common in the

openings. The habitats have wild lupine, the sole larval food source, nectar plants for adult feeding, critical microhabitat, and attendant ants. The stature and spacing of trees in native savannas is somewhat variable, reflecting differences in soils, topography and climate, and the distribution of trees in contemporary habitat is similarly diverse. Soils are typically well drained sandy soils which influences both plant growth and disturbance frequency. These conditions are generally wet enough to grow trees but dry enough to sustain periodic fires. Topography is diverse and includes flat glacial lakebeds, dune and swale lakeshores and steep dissected hills.

Dune and swale habitats are one of the most biologically diverse in the Great Lakes Basin, originally extending along the shore of Lake Michigan from southern Wisconsin through the Chicago and Gary metropolitan areas and north into southwestern Michigan. The dunes are in close proximity to the swales creating an extreme diversity of regularly alternation sub-habitats from xeric, sandy upland habitats to wetlands, and back to uplands and again to wetlands over a distance of less than 50 meters. Karner blue populations can be found in the upland, which are oak barrens habitats, but adults will forage on nectar-producing plants in the adjacent wetlands.

Karner blues also occur in many other habitats managed for various purposes. These include power line and highway rights-of–way, airport safe ways, young managed forest stands, open areas within managed forest stands, along forest trails and roads on military bases, and many other such areas. These areas all have soils that are suitable for lupine growth, an open canopy, and management that causes soil disturbance or suppression of perennial shrub and herbaceous vegetation (such as mowing, brush hogging, logging, chemical control or prescribed fire), These habitats are very diverse vegetationally, and support herbaceous species that co-occur with lupine in the native remnant barrens and savanna habitats.[1]

2.0 ENVIRONMENTAL SETTINGS / BIOLOGICAL RESOURCES

2.1 Environmental Setting

The following is general information of the climate, geological history and current geography and ecology of the Dune and Swale

oak savanna areas south of Lake Michigan. The information is intended as an overview of how the area was formed and why it has the unique characteristic that it has, which leads to the presence of wild lupine and the Karner blue butterfly.

Each location that will be covered by this HCP may vary slightly and specific site characteristics are described more in depth in part 1.3.

2.1.1 Climate

The weather in the Great Lakes Basin is affected by three factors: air masses from other regions, the location of the basin within a large continental landmass, and the moderating influence of the lakes themselves. These factors result in a wide range of climatic conditions throughout the year, ranging from dank, humid days in the summer to Arctic cold blasts resulting in lake effect snow on the lee side of the lakes. Average temperatures are 20 degrees Fahrenheit in January to 73 degrees Fahrenheit in July. Snowfall averages per year is 39.2 inches and average rainfall is 34.66 inches per year.[4]

2.1.2 Geography/Ecology

The extraordinary diversity of the flora and fauna in the Lake Michigan coastal area is a result of several natural processes that have contributed to the formation of the shoreline. As the glacial ice retreated about 12,000 years ago, fluctuating lake levels in combination with wind and wave actions contributed to the formation of the physiography of the coastal area and influenced the distribution of the plant and animal species. Habitat formation resulted from the development of the Calumet Lacustrine Plain, the Valparaiso Moraine Area, and the stabilization of these areas by vegetation. The species diversity and complexity of the initial stabilizing plant communities changed with time, subsequently resulting in a series of habitat types ranging from bare sand to forest, and from open water to marsh.

As the glacier retreated north, erosion continued to cut new channels and deepen existing channels, causing the elevation of the glacier formed lake to rise and fall - and rise and fall again. Three times the elevation of the lake stabilized at a particular level, marking these stages clearly in the Indiana Dunes in the form of beach ridges and

wetland complexes. The sand hills, lined up in rows parallel to the lakeshore, represent old shoreline dune complexes.

The water level fluctuated many times before stabilizing approximately 2,000 years ago at approximately 575 to 585 feet above sea level; however, these stages are less distinct.[5]

The dune ridges and swales areas were formed about 4000 years ago. There are several schools of thought concerning the manner in which the beach ridge and swale topography was created. One maintains that the ridges are former offshore shoals or sand bars, which were left exposed after establishment of each successively lower major shoreline. This implies that a rapid major lowering of lake level was involved. Another view suggests that each ridge represents a gradual lowering of lake level and northward shoreline recession. This thesis is predicated on the thickness of organic deposits in the swales. Thicker organic deposits are found further inland. Another thought is that these features are compound structures representing alternating periods of erosion and deposition.[5]

Deposition is the result of sediment dis-equilibrium caused by the transportation of an overabundance of sediments by along-shore currents. The deposits are highly mobile and impermanent and easily susceptible to erosion by near-shore processes. During constructional periods the beach ridges are added in regular manner and exhibit a uniform spacing. Erosional stages, however, do not remove the ridges in a regular manner but reflect directions of maximum wave energy.[6]

The soils in the Dune and Swale areas are of the Oakville-Tawas Association. The ridge soils are Oakville fine sand, which consists of deep excessively drained, coarse textured sand, on moderate to strong slopes (12 to 25%). The Tawas muck soils of the swales consists of deep, very poorly drained, organic matter over mineral soil. [7] These swales have a high water tables, but may dry up during the summer season.[6] Ground water table are directly related to lake levels, and can be noticeably higher when there is a strong north wind causing lake levels in the south to rise.

Other soils in the plan area are Adrian and Houghton, which are located in the wet areas.[7]

Plant succession is influenced by surface geology, soil type, nutrient availability, drainage, exposure, slope, and other factors. The general trend of plant succession in the coastal area, if undisturbed by man, is from (1) bare sand to forest, (2) old field to forest, and (3) open pond to swamp.

Beach grass is the first vegetation to become established in shifting sand, beginning the gradual process of dune stabilization. Bearberry, a procumbent evergreen shrub, begins to occur just north of the beach grass. Species such as sumac, sand cherry, cottonwood, and prostrate juniper are present as elevation increases.

The dunes are characterized by a series of hills comprised of foredunes, interdunes, and backdunes. The interdunes are protected by the foredunes and as a result, moisture availability increases. The moisture allows the occurrence of basswood, oaks, tulip poplar, white pine, and ash. On drier ridges and slopes of the interdunes, black oak is the dominant species. The backdunes, the third row of sand hills from the lakeshore, are forested with black oak, white oak, and sassafras. Blueberry, greenbrier, false Solomon's seal, and bracken fern occur in the understory. As moisture increases, Canada mayflower, Indiana cucumber, cinnamon fern, and royal fern begin to occur.[5]

2.1.3 Existing Land Use

The current land uses of the areas covered by this HCP are electric, natural gas, and water utility right-of-way and easement. The ROWs are typically 50-150 feet wide and may carry 1-4 different high voltage transmission circuits ranging from 34KV to 375KV, and natural gas or water pipelines ranging from 8"-36" in diameter. Greater description of the individual ROW was covered in 1.3 Plan area site description section of this HCP. All of the ROW covered by this HCP are owned and operated by the Northern Indiana Public Service Company with the exception of the Ogden Dunes ROW, which is owned by the Indiana-American Water Company.

2.2 Species of Concern

2.2.1 Karner Blue Butterfly

Karner Blue Butterflies (Appendix A, Figure 4) are small with a wingspan of about 2.5 cm. (one inch). The forewing length

of adult Karner blues is 1.2 to 1.4 cm for males and 1.4 to 1.6 cm for females (Opler and Krizek 1984 USFWL). The upper (dorsal) side of the male wing is a violet blue with a black margin and white-fringed edge. The female upper side ranges from a dull violet to bright purplish blue near the body and central portions of the wings, and the remainder of the wing is a light or dark gray-brown, with marginal orange crescents typically restricted to the hind wing. Both sexes are a grayish fawn color on the ventral side. Near the margins of the underside of both wings are orange crescents and metallic spots. The black terminal line along the margin of the hind wing is usually continuous (Klots 1929, Nabokov 1944). Male genitalia is the most reliable character for distinguishing adult *L.m.samuelis* from other subspecies (and species)(Nobokov 1944,1949).

The eggs of the Karner blue are tiny and radially symmetric, about 0.7 mm in diameter, somewhat flattened, and pale greenish-white in color (Dirig 1994). The surface is deeply reticulated with a fine geometric pattern (Scudder 1889). Larvae are a pea-green color, pubescent and dorsally flattened, with a brown-black to black head capsule. The head is often not visible as it is tucked under the body. Older larvae have pale green (to white) lateral stripes, and a dark green longitudinal stripe dorsally. In pre-pupal larvae the lateral stripes become less distinct and the color becomes a duller green. Larvae have four instars (Savignano 1990), and three glandular structures that are known to mediate interactions with ants in other species of Lycaenidae. Some of these glandular structures mediate interactions with ants in Karner blue, but it is not known what is secreted by any of the structures, and it is not known if any of the structures are active throughout larval life. Pupae are bright green and smooth, changing to a light tan with hints of purple shortly before emergence when the pharate adult cuticle separates from the cuticle of the pupal case.[1]

Karner Blue Life Cycle

The Karner blue butterfly is a bivoltine (Appendix A, Figure 5), which means that it completes two generations (Appendix A, Figure 6) per year. In typical years, first brood larvae hatch from overwintered eggs in mid to late April and begin feeding on wild lupine (*Lupinus perennis)* (Appendix A, Figure 7), the only known larval food source. Larvae pass through four instars, between which the relatively soft larval exoskeleton is shed. Feeding by first and second instar

larvae results in tiny, circular holes in the lupine leaves while older larvae eat all but the upper and lower epidermis, creating a characteristic window-pane appearance. Larvae feed for about three to four weeks and pupate in late May to early June. Ants commonly tend larvae. Larvae tended by ants have a higher survival rate than those not tended, presumably because the ants provide some protection from larval natural enemies. Larvae possess specialized glands that secrete a liquid that is avidly harvested by ants, probably containing carbohydrates and amino acids. Tending levels for late instar larvae are close to 100 percent. In most cases, however, very few early instars are tended. Mature larvae enter a wandering phase after which the pre-pupal larvae attach themselves to various substrates with a silk thread. Karner blues are known to pupate in the leaf litter, on stems and twigs, or occasionally on lupine leaves. Pupation generally lasts seven to eleven days. Adults begin emerging in late May through mid-June. Peak flight for males usually precedes peak flight for females by a couple of days. Adults are believed to live an average of four to five days, but can live as long as two to three weeks. First flight adult females lay their eggs primarily on lupine plants, often singly on leaves, petioles, or stems, or occasionally on other plants or leaf litter close to lupine plants.

Second brood eggs hatch in five to ten days, and larvae can be found feeding on wild lupine leaves and flowers from early June through late July. Typically, a larva can survive on one large lupine stem, however, it moves from leaf to leaf on the lupine stem, often returning to leaves fed on during earlier instars, and it may even move to other lupine stems. Larvae are found often on the lower parts of the stems and petioles. Ants also typically tend second brood larvae, but during midday on hot days tending may be reduced. Ants also frequently tend pupae.

Second brood adults begin to appear in early to mid-July and fly until mid-August. Flight phenology may be delayed because of cool wet summers and result in an adult flight period lasting through late August. The peak flight period usually lasts one to two weeks. Generally, there are about three to four times as many adults in the second brood compared with the first brood, but exceptionally poor years can occur where the second brood is not larger than the first brood. First brood is usually smaller probably because of high over wintering mortality of eggs, the inability of larvae to

find lupine in the spring, or greater oviposition success of first flight females.

Karner Blue adults are diurnal and initiate flight between 8:00-9:00 a.m. and continue until about 7:00 P.M. a longer flight period than most butterflies. Adult activity decreases in very hot weather, at temperatures lower than 75 degrees Fahrenheit, during heavy to moderate rains, or during extremely windy conditions. [1]

Dispersal

Nearly all researchers that have examined Karner blue dispersal concluded that dispersal rates and distances for the butterfly are relatively low and short with nearly all movement less than 200 meters (220 yards). In one study a maximum dispersal distance of 3 kilometers and 92.5% of Karner blues moving less than 1.5 kilometers in an open habitat area of Necedah NWR, were measured. Although these findings expand the spatial scale of dispersal by almost an order of magnitude, the inferred rates and distances are still relatively low and short.[1]

Rangewide Distribution of Karner Blues

Historically, the Karner blue butterfly occurred in a geographic band between 41^{o} and 46^{o} N latitude extending from Minnesota to Maine (Dirig 1994). The butterfly is commonly found on sandy soil types that have populations of *Lupinus perennis* (the only known larval food source), and often inhabits communities similar to oak and pine savanna/barrens communities. In this conservation plan, the term "lupine" will refer to *Lupinus perennis* to the exclusion of all other species of *Lupinus*. Dirig (1994) reviewed numerous locality records of Karner blue, and his work is an exhaustive summary of the reports of Karner blue occurrence. The historic northern limit of the butterfly corresponds roughly with the northern limit of lupine (Dirig 1994), but many of the most northern populations of Karner blue have been extirpated. Lupine has been reported from as far north as northern Vermont, and Elk Rapids, MI, but there are no records of Karner blue from these sites. The only populations of Karner blue now near the northern limit of lupine occur within the Superior Outwash Recovery Unit in Wisconsin.

The historic western limit of the butterfly roughly corresponds with the western limit of lupine (Dirig 1994), and butterfly

distribution appears to have contracted away from this limit as well. Although lupine occurs as far west as central Minnesota, the western-most record of Karner blue is at Anoka, MN, approximately 50 miles to the east. The Anoka population was extirpated sometime after 1984. The Iowa populations on the southwest fringe are also extirpated. Currently, the western-most populations of Karner blue occur in the Superior Outwash Recovery Unit and a small population occurs at the Whitewater Wildlife Management Area in southeast Minnesota in the Paleozoic Plateau Recovery Unit.

The historic eastern limit of the butterfly roughly corresponds with the eastern limit of lupine. No historic or current records of Karner blue exist in Connecticut, Rhode Island, eastern Massachusetts, or eastern Long Island, but these native habitats were converted to incompatible human uses long ago, so the previous presence of the butterfly cannot be verified. Nonetheless, based on the biology of the butterfly and information on the native habitats, the butterfly probably inhabited these areas in the past. The eastern-most historic records of Karner blue exist from southwest Maine and throughout the Merrimack River valley system in New Hampshire and Massachusetts, but currently, this eastern-most population has contracted to a very small population near Concord, NH.

Unlike the other geographic limits, the historic southern limit of the butterfly does not correspond to the southern distribution of lupine. The distribution of lupine extends farther south than Karner blue in eastern U.S. along the eastern Appalachian Mountains and the Atlantic Coastal Plain, and in central U.S. in Illinois (Dirig 1994). Some of the historic records of Karner blue along this southern limit are uncertain. The southern-most record near Covington, IN, is probably erroneous. The recovery team could not find a specimen associated with this record, and lupine has not been recorded from near this locality. The lack of correspondence of the southern limits of Karner blue and lupine has not been adequately addressed. Dirig (1994) suggested that the southern limit of Karner blue may follow the band of 80-100 days continuous winter snow cover, which he hypothesized was necessary for high over wintering egg survival. Many other hypotheses could explain the southern distribution limit of Karner blue.

Despite this uncertainty, similar to the other geographic limits, the distribution of Karner blue has contracted away from its historic southern limit. Populations have been extirpated from southern New York, Pennsylvania, Ohio, Illinois, and Iowa.

In Indiana, the distribution has contracted. Once present throughout northern Indiana, it now occurs only in a few localities in northwestern Indiana, associated with the dune fields and dune and swale complexes near the southern end of Lake Michigan.

As of fall, 1996, populations of Karner blue existed in Indiana, Michigan, Minnesota, New Hampshire, New York and Wisconsin. Almost all known extant populations occur on sandy soils associated with glacial outwash plains and terraces, glacial moraines, the shores and bottoms of glacial lakes, the glacial shores of existing lakes, and dissected sandstone outwashes (Andow et al. 1994 and references therein). Wisconsin and Michigan have the largest number of local populations with the greatest numbers of individuals, and New York also has one large population (Baker 1994). Many local populations of the butterfly appear extirpated, and the states of Iowa, Illinois, Ohio (reintroduced in 1998) Pennsylvania, Massachusetts, Maine, and the Canadian province of Ontario no longer support populations of the butterfly (Baker 1994). [2]

Indiana

Historically, the Karner blue was reported from eight counties in Indiana. In 1990, Karner blue butterflies were identified at 10 sites out of 35 potential sites surveyed. Two population clusters were identified within two counties (Lake and Porter), the majority of which was associated with medium to high quality Karner blue habitat. The early surveys in Porter County (including Indiana Dunes National Lakeshore) identified between 1,000 and 10,000 second brood Karner blue adults. In Lake County, at the IDNL, several thousand second brood adults were estimated, and in other Lake County sites, the subpopulations likely number between 100-500. Several subpopulations occur in West Gary associated with a remnant dune and swale complex.

Currently it is estimated that 17 subpopulations of Karner blues occur at IDNL. In West Gary, about 21 tracts clustered into 11 individual preserves and management areas have

been identified as potentially able to at least periodically support the Karner blue. Karner blues have been documented on four of these tracts, which comprise the only extant subpopulations of Karner blues in West Gary.[1]

Importance of Conservation Measures to Karner Blue Butterflies in Northwest Indiana

Insects are a vital part of prairies and other plant communities, and although *there have been no reported extinctions of prairie insects*, a number of insect species have declined seriously (Pyle, *et al.* 1981). Invertebrates, however, are often not considered in conservation efforts. Most prairie reserves or parks are managed with maintenance of plants or particular vertebrate species as the focus. Other lands with prairie or similar habitats are managed for a variety of economic purposes unrelated to conservation. Success or failure of property management plans, where they exist, is generally based on the maintenance of the overall prairie habitat (Opler 1981) or other economic outcomes.

The Karner blue butterfly is representative of many species that are threatened with extinction, as anthropogenic modification of whole landscapes causes the loss of habitat (Andow, *et al.* 1994). Today, the disappearance and fragmentation of the pine and oak savanna habitats, through a variety of causes, has been a major contributor to the range-wide decline of the Karner blue butterfly (USFWS 1992a, 1992b; and works cited therein). In addition, natural plant succession in these habitats has eliminated Karner blue butterflies from some areas.

There is reason to believe that small, isolated insect populations that persist on small sites may do so precariously (Panzer 1988). In general, small populations are subject to debilitating effects of demographic instability, genetic deterioration and natural catastrophes (Wilcove 1987). Several attributes, including fluctuating population densities, relatively poor dispersal abilities and patchy distributions make remnant-restricted insects particularly susceptible to extinction from these phenomena (Panzer 1988). Butterflies that specialize on plants found primarily in early successional habitats track an ephemeral food supply that is dependant on unpredictable ecosystem disturbances. For such species, suitable habitat can be a shifting and increasingly smaller fraction of a greater landscape mosaic

that results in local species extinction events that are both frequent and inevitable (Cushman and Murphy 1993). Karner blue butterflies appear to have all of these characteristics. As such, the availability -- or absence -- of suitable habitat mosaics will play a key role in the long-term survival of the species. [1]

Karner Blue Butterfly on NIPSCO and INAWC Properties
This section briefly describes the distribution and abundance of known and potential Karner blue butterfly habitat on NIPSCO and INAWC properties.

- **Known habitat**
  Defined as those surveyed areas where wild lupine has been found and which can support Karner blue butterflies. This area is delineated by the JF New 2004 baseline survey and will be updated every other year.

- **Known-occupied habitat**
  Defined as, those areas that currently support Karner blue butterflies in association with wild lupine. These areas are delineated by the JF New 2004 Baseline Monitoring Report and will be updated every other year.

- **Potential habitat**
  Defined as, areas where wild lupine is likely to grow or has been known to have grown in the past. Given the knowledge of certain ecological criteria such as the distribution of wild lupine, general soils information and climatic parameters relating to the Karner blue butterfly, potential habitat distribution and abundance is somewhat predictable. All areas covered by this HCP will be considered potential habitat unless otherwise specified.

2.2.2 Wild Lupine

Lupinus perennis (Appendix A, Figure 7) is a member of the pea family (Fabaceae) and has the common names wild lupine and blue lupine. Lupine is the only known food plant of larval Karner blues and is an essential component of its habitat. Two varieties have been identified: *Lupenus perennis* var. occidentalis*S Walts and* L. perennis Ivar. *Perennis* L. The varieties are morphologically similar except for the former has spreading pilose hairs and the latter thinly pubescent hairs. The Karner blue may use both varieties, but the details of the interaction are not known. The inflorescence is a raceme of numerous small flowers which

are two lipped, with the upper lip two-toothed and the lower lip unlobed. Flower color ranges from blue to violets and occasionally white or pink. Peak bloom typically occurs from mid-May to late June within the geographic range of the Karner blue, but varies depending upon weather, degree of shading, and geographic location in its range. Stem density and flowering is greatest in open-to partial-canopied areas, although areas receiving high solar radiation can have low lupine densities and may be less than ideal habitat. Plants in dense shade rarely flower.

Lupine distribution extends from Minnesota east to New England, then southward along the eastern Appalachian Mountains to southern Virginia and along the eastern coastal plain to Georgia wrapping around the Gulf coastal plain to Louisiana. Surveys of lupine throughout its northern range all report populations to be declining and many sites have been extirpated. The primary cause of this decline appears to be loss of habitat from conversion to housing, retail, light industrial, and agricultural development, and degradation of habitat because of the deep shade that develops when disturbance is interrupted.

Lupine reproduces vegetatively and by seed. Seedpods have stiff hairs with an average of 4-9 seeds per pod. When seedpods are dry, they suddenly twist and pop open (dehisce), throwing seeds several feet. This is the only known dispersal mechanism, giving lupine a colonization distance of about 20-79 inches per year. Seeds are known to remain viable for at least three years, do not have physiological dormancy, and will readily germinate if moisture and temperature conditions permit. The hard seed coat produces an effective dormancy and germination is usually enhanced by scarification, stratification and/or soaking in water.

Lupine also reproduces vegetatively by sending up new stems from rhizomatous buds. Usually plants a few years old will form a clump of several stems and in areas with dense lupine it is difficult to distinguish individual lupine plants. Established lupine plants do not grow every year. It is not known how long established plants can remain dormant.

Lupine is an early successional species adapted to survive on dry, relatively infertile soils. Even the seedlings have long

taproots that presumably allow the plant to reach soil moisture. It can grow on soils low in nitrogen because of its association with nitrogen fixing bacterium *Rhizobium lupina*, and does not do well when grown without *R. lupina.* Similar to other legumes, it probably does best when growing on nitrogen-poor soils that have sufficient phosphorus. Lupine does not reproduce in dense shade. All available evidence suggests that lupine thrives on nitrogen-poor soils in partial- to open-canopied areas, and phosphorus–poor soils.

Several species of pines, oaks, and shrubby vegetation are adapted to the same soils and habitat as lupine, and without disturbance, they will close the canopy, shading and suppressing lupine. The rate of closure will vary from locality to locality, based on edaphic and prevailing climatic conditions and current and historic management practices. If the habitat supports high grass and sedge productivity, litter could build up and suppress lupine. Consequently, disturbances that reduces tree and shrub canopy cover are necessary for lupine to persist, and under some conditions, occasional disturbances that remove the litter layer are needed for lupine regenerations. Several disturbances have been suggested to be beneficial for renewing lupine habitat, including prescribed fire, tree removal, and variety of methods to kill trees and shrubs.[1]

2.2.3 Nectar Food Resources

Adult Karner blue butterflies feed at flowers, sipping nectar and presumably obtaining nourishment; adult feeding increases longevity and fecundity in many Lepidopoteran species, especially butterflies. Although increased longevity and fecundity have not been specifically demonstrated for the Karner blue butterfly, it is generally agreed that nectar is an essential adult resource. Adult Karner blue butterflies spend considerable time nectaring on a wide variety of plant species. Adults have been observed during the first brood to feed on flowers of 39 species of herbaceous plants, and 9 species of woody plants, and during the second brood on flowers of 70 species of herbaceous plants and 2 woody plants.[1] Appendix A, Figure 8 shows nectar species found in the HCP area.

3.0 Description of activities covered by permit

Actions by NIPSCO or INAWC that may result in an incidental take of Karner blue butterfly(s) include any otherwise lawful activity by any

NIPSCO or INAWC employee, contractor or agent required to safely and effectively operate and maintain the electrical transmission lines along the Aetna, Miller, and Stagecoach Rd. ROWs, and the Ogden Dunes easement on the INAWC ROW and water mains and pipelines within the Ogden Dunes ROW. To NIPSCO's and INAWC's knowledge, no incidental take has occurred at these locations to date.

3.1 NIPSCO Maintenance Activities covered by permit

Disturbances caused by maintenance activities that will take place on these ROW will be temporary in nature. These activities are listed below.

3.1.1 Transmission Line Maintenance

Transmission lines do not require extensive annual maintenance. Activities that may take place during the existence of a transmission line may include, but are not limited to the following: tower maintenance, insulator cleaning, repair or replacement, static line maintenance, tower painting, Emergency Work (described below), replacing conductors (descried below), and Vegetation Management (described below). Each type of maintenance is distinct but will require vehicle access to the ROW and along the path of the conductors. Photos of the potential vehicle can be found in Appendix E

3.1.2 Replacing Electrical Conductors.

When an electrical conductor reaches a certain age, shows signs of wear, or does not meet the load requirement it may need to be replaced. The replacement of conductors requires vehicle access along the length of the ROW. The replacement may take several weeks to several months, however work in any one location may be limited to a few weeks at a time. Vehicles used in the replacement of an electrical conductor are similar to those in Appendix E.

3.1.3 Gas Line Maintenance.

Gas lines similar to electric transmission lines do not require extensive annual maintenance, however when maintenance is required, soil disturbance is necessary. Gas line maintenance may include but is not limited to valve replacement, and pipeline replacement in total or section. In the event that maintenance is required on a gas line, excavation will be required. The area will be excavated exposing the pipe. Soil removed from the trench will be placed on the ROW adjacent to the work area. Upon completion of the required work the pipe will be buried, using

the soil removed from the trench. Vehicle used in the gas line maintenance are similar to those in Appendix E.

3.1.4 Gas line construction or replacement.

When a gas line reaches a certain age, fails to function as designed, or does not meet the load requirements, the entire line may be replaced, or an additional line added to the ROW. In such a situation excavation and earth disturbance will be required. Construction or replacement of a gas pipeline will require a disturbed area of ROW 50-70 feet wide, the entire length of the project. A typical cross section of this type of construction would involve an access road, trench and spoil pile. Project lengths vary depending upon the scope of the project. Vehicles used in the gas line construction or replacements are similar to those in Appendix E.

3.1.5 Emergency work

At any given time an emergency may arise in which repairs and maintenance must be done immediately**. An emergency is defined as an immediate danger to life, health or the environment.** Examples of emergencies are, but are not limited to, the following, towers or lines failure due to ice storms or tornados, trees falling into conductors, damage caused by a vehicle, or gas line or facility rupture. This work will usually result in vehicle access to the ROW day or night, without prior consultation with the Nisource Environmental Health and Safety Department and hence the US Fish and Wildlife Service. Vehicles used in Emergency work are similar to those in Appendix E.

3.1.6 Vegetation Management

All of the ROWs covered in this plan are subject to a cyclical vegetation management schedule to control tall growing tree species. Integrated Vegetation Management (IVM) techniques are currently being used on these ROWs. This IVM plan includes mowing or hand cutting to reduce the height and density of woody stems. This will be accomplished by using a Brown Cutter with the minimum cut height of 8-inches or higher, or manually with chainsaws. Mowing will take place after first frost, and preferable when the ground is frozen to reduce rutting. This will be followed by herbicide application the next fall, using a low-volume radiarc application. In subsequent years, spot herbicide treatment with backpack or ATV sprayer will be used to

selectively target woody species that regenerate. All herbicides used on NIPSCO ROW will be pre-approved by NIPSCO Forestry Operations. A current list of pre-approved herbicides can be found in appendix E. This list will be updated from time to time if new or other herbicides are determined to be beneficial in achieving the goals of IVM on the ROW. Side trimming of adjacent trees from a bucket truck will also be done to protect the conductors from contact with ground vegetation. Vegetation management will follow the protocol established in Appendix F of the Wisconsin HCP (Conservation Protocols and Guidelines for the Karner Blue Butterfly) for mechanical management. Photos of typical vegetation management equipment used can be seen in Appendix E of this HCP.

Fires in the areas adjacent to the ROW are frequent and sometimes spread to the plan area. NIPSCO may use fire as a vegetation management tool and will follow the protocol established in the Wisconsin HCP. See Appendix F for an excerpt of Appendix F from the Wisconsin HCP.

3.2 INAWC Activities covered by permit

Disturbances caused by construction and/or maintenance activities that may take place within the Ogden Dunes easement will be temporary in nature, and include:

3.2.1 Water Main Maintenance

Water mains typically do not require extensive annual maintenance, however when maintenance is required soil disturbance is necessary. Water main maintenance typically includes minor leak repair and/or the replacement of corroded appurtenances related to water mains, bolts, fittings, etc. Maintenance requires the excavation of the affected area to expose the water main for repairs. Soil removed from the excavation will be placed within the easement adjacent to the work area. Upon completion of the repairs, the water main will be reburied using these excavated soil materials. Equipment used in water main maintenance typically includes backhoes, track excavators, front-end loaders, bulldozers, air compressors, dump trucks and crew trucks.

3.2.2 Water Main Construction

When a water main reaches the end of its useful life or additional supplemental water supply capacity is needed, the main may be replaced or an additional water main may be

constructed within the easement. The related construction activities will typically require use of the entire width of the easement for the entire length of the project. This is necessary for the on-site stringing of new pipe materials, trench excavation, and temporary placement of trench spoils before backfilling. Equipment used for water main construction and/or replacement would include that listed above for water main maintenance (3.2.1).

3.2.3 Emergency Work

Emergency work includes repairs and/or maintenance activities that must be done immediately because of loss of water service, danger to public safety or health, or damage to the environment. Typically, emergencies involve major ruptures of water mains and the dispersion of water main contents under high pressure. Emergency work will usually require equipment access to the easement at any time of day or night without prior consultation with the US Fish and Wildlife Service. Equipment used in emergency work is the same as that listed for water main construction and maintenance.

3.3 Implementation of the Karner Blue Butterfly Habitat Conservation Plan.

Any activities that will take place on the plan ROW's specifically intended to improve the KBB habitat have the potential to cause temporary impacts to the habitat.

4.0 Potential Biological impacts/Take Assessment

4.1 Direct and Indirect Impacts

Direct impacts to the KBB's or its habitat that will most likely result from activities covered by this plan (section 3) are described below.

- Personnel, vehicles or other equipment crushing wild lupine or nectar plants or root systems, resulting in the death of the plants
- Personnel, vehicles or equipment killing a resting KBB
- Excavating an area where wild lupine or nectar species are present, resulting in the death or destruction of the plants
- Piling spoils from excavation on KBB, wild lupine, or nectar species resulting in the death or destruction of the butterflies and/or the plants.
- Personnel, vehicles, or equipment disturbing plants or soil containing KBB eggs, resulting in destroyed eggs.

- Woody debris resulting from mowing may cover wild lupine or nectar species locations and inhibit growth until debris biodegrades.

4.1.1 Anticipated Take: Wildlife Species

The Karner blue butterfly, *Lycaeides melissa samuelis* Nabokov (Lepidopetera: Lycaenidae).

4.1.2 Anticipated Impacts: Plant Species

Wild lupine, *Lupinus perennis* L. (Fabaceae
KBB Nectar species

5.0 CONSERVATION STRATEGY/MEASURES TO MINIMIZE AND MITIGATE FOR IMPACTS

5.1 Karner Blue Butterfly Habitat Improvement Plan

This KBB habitat improvement plan will be implemented as part of the desired alternative described below. The key to the HCP is directly related to the success of the plan described below.

Since it is difficult to take a census of KBB populations and the potential take of the KBB, and since the KBB is tied to its habitat, this plan will focus on suitable habitat level along with occupied habitat rather than population numbers. Therefore a baseline habitat survey was conducted. In the summer of 2004, biologists from JF New and Associates surveyed and plotted the wild lupine populations on the 86 acres of NIPSCO and INAWC ROW covered in this plan using GPS technology. Notes were also made regarding the nectar species present. **The baseline for this Habitat Conservation Plan is 4.244 acres. This will be referred to throughout the plan as the "2004 HCP Baseline", "baseline habitat" or simply the "baseline".**

A copy of the 2004 baseline survey report can be found in Appendix B.

This baseline will establish the levels of wild lupine located in the plan area. At no time will the acreage fall below the established baseline level as a result of activities by or authorized by NIPSCO or INAWC.

In order to ensure that wild lupine populations stay at or above the baseline level, the KBB habitat improvement plan as detailed in this section, will be implemented.

The success of this HCP will be measured by the availability of potential KBB habitat in the plan area at any give time throughout the year. A key component of the NIPSCO KBB HCP is the improvement of the KBB habitat. NIPSCO will enhance the current habitat and promote the distribution of wild lupine and nectar species throughout the plan area. NIPSCO will modify it's vegetation management techniques to specifically target the enhancement of Karner blue habitat. Tall growing species that shade lupine out to the point they cannot survive will be eliminated or altered to reduce shading. Non-native exotic species will be treated with herbicide to increase the potential for wild lupine and nectar plants to spread and become established in new areas. Vegetation management techniques will generally not be implemented from April through August. Prescribed burning may also be used as a management tool to help restoration and enhancement efforts. All burning will follow the requirements in the Wisconsin KBB HCP. See appendix F for an excerpt from the Wisconsin Conservation Protocols and Guidelines for the Karner Blue Butterfly.

To further increase the Karner habitat and minimize the potential to drop below the baseline level, active habitat restoration efforts will take place throughout the HCP areas. These efforts will take place in all areas that will support KBB habitat where it currently does not exist, including the 9 upland acres of the 12.85-acre mitigation area adjacent to the Miller substation and ROW. NIPSCO will plant Wild Lupine seed using a non-till native seed drill at a rate of 14 lbs/acre or 224,000 seeds per acre. In addition to the wild lupine seed, small amounts of forbs will be added which will provide nectar sources for the Karner blue butterflies. NIPSCO's current budget will support 15 acres of seeding every other year. This will take place over the next 6 years and will create nearly 60 additional acres of KBB habitat in the HCP area.

The mitigation area will be the priority for restoration. Once this is successful, the planting will take place adjacent to known habitat so that the KBB can spread into these areas. This will also connect occupied habitats with unoccupied habitats, which will allow the KBB to spread into these areas.

The mitigation area adjacent to the Miller ROW and substation does not contain any facilities. The area, which is composed of dense honeysuckle brush, wetlands, and a dense stand of black oak, will be thinned in an effort to release dormant wild lupine that once was present in this area. The mitigation area will be set-aside as a habitat management site and will not be subject to any disturbances or impacts, other than managing for KBB suitability,

and therefore should increase the available KBB habitat. Since the current baseline habitat level is 4.244 acres, the 9 acres of upland at the mitigation site will be large enough to support that level as well as additional habitat. This site will be managed as KBB habitat for the life of this HCP.

To aid in the distribution of the Karner blue, efforts may be implemented to transplant adult Karner blue to unoccupied locations covered by this HCP, in a manner approved by the US Fish and Wildlife.

All activities taking place on ROW covered by this plan will be coordinated through the NiSource Environmental Health and Safety Department. No routine maintenance will be scheduled to take place from April through August, unless it can be demonstrated that the temporary impacts will not reduce the amount of KBB habitat or occupied habitat below the 2004 HCP Baseline level. Any emergency work that must take place during this time will be done in a manner to minimize impacts to the KBBs, wild lupine and nectar species. Upon completion of any maintenance activities, the ROW will be restored to its natural grade and over seeded with wild lupine at a rate of 14 lbs/acre or 224,000 seeds per acre. In addition to the wild lupine seed, small amounts of forbs will be added which will provide nectar sources for the Karner Blue butterflies. Temporary impacts should never cause the population of wild lupine to fall below the 2004 HCP Baseline level.

NIPSCO will conduct annual awareness training for it's employees to ensure that any NIPSCO employee who will be working in the areas described in this plan are aware of the restriction of this plan. Furthermore they will be instructed to contact the NiSource Environmental Health & Safety Department during the planning stage of proposed work in the plan areas. Signs will be posted on ROW covered by this HCP that alert personnel that this is a sensitive site that requires coordination with the NiSource Environmental Health and Safety Department, or the INAWC Environmental Management and Compliance department, prior to any activity. Examples of the signs can be seen in Appendix A, figure 9.

Every two years the wild lupine populations will be surveyed using GPS technology, nectar species will be noted. The results will be charted to determine the success of the plan. A layer will be added to the NIPSCO internal GIS system and engineering drawings. This will allow project coordinators to take the habitat information into account during the planning phase of any proposed project.

5.2 Monitoring and Reports

Since numbers of active Karner blue butterflies can vary due to its life cycle, it is unlikely that an accurate count of Karner blues can be obtained. Instead, surveys will focus on amount and quality of suitable habitat for the Karner blue butterfly along with KBB presence/absence surveys. Plant surveys will primarily concentrate on wild lupine, which is the only known host plant for the larval stage of the Karner, and therefore the Karner could not exist without it. Secondary information will be gathered for nectar plants. Baseline data for the wild lupine has been gathered by means of a GPS unit and recorded as a layer on a GIS system. Data will be collected every two years to track the changes in wild lupine distribution. This will help determine if the management techniques are meeting the plan objectives or if they need to be altered. All surveys will be done using methods approved by the USFWS.

An annual report will be prepared that will describe the techniques used to enhance the habitat and will present the results of this years or previous years management. Included in the report will be maps indicating known habitat, known-occupied habitat (presence/absence data), and potential habitat. These maps will also include previous years information so that the distribution and populations can be tracked. Copies of this annual report will be sent to the local office of the US Fish and Wildlife and the local office of the Nature Conservancy.

5.3 Measures to Mitigate Unavoidable Impacts

The 12.85 acre area as described in section 5.1 Karner Blue Butterfly Habitat Improvement Plan, will be used as mitigation. Once the wild lupine population at this site covers an area of 4.244 acres or larger, there will be no risk of falling below the baseline. This site will be set aside specifically for the management of KBB habitat. No activities will take place on this site other than habitat management. In addition to this mitigation site, habitat improvement will be implemented as described in section 5.1 on all areas covered by this HCP. These improvements along with the mitigation site will ensure that activities performed by NIPSCO or INAWC will not impact the current level (4.244 acres) of KBB habitat located on the ROW covered by this plan.

6.0 FUNDING

6.1 Funding for minimization and mitigation measures

All work done as part of NIPSCO's vegetation management program will be funded through the NIPSCO Forestry Operations. Any activity above and beyond the scope of vegetation management will be funded through a specific Karner Blue Butterfly Plan line item in the NIPSCO annual budget. Budgeted funds will be sufficient to cover work including but not limited to; all work on areas off of ROW, data collection, seeding, planting or transplanting wild lupine and/or nectar species, and preparing annual reports.

Any activity above and beyond the scope of vegetation management on INAWC ROW will be funded by INAWC, unless initiated by NIPSCO.

7.0 ALTERNATIVES

This plan is being implemented on electric, gas and water ROW that has been constructed prior to the listing of the Karner blue butterfly. Routine maintenance, improvement, and emergency work, however must take place at times on these ROWs. The project alternative listed below will focus on routine electric, natural gas, and water line construction, maintenance, emergency work procedures, and ROW vegetation management.

7.1 No action Alternative

The alternative of no action was considered. This alternative is not possible since the infrastructure to be maintained is already present. These facilities absolutely must be maintained in order for safe and reliable distribution and transmission of gas and electric energy. Consequently if vegetation management were not performed, woody species would shade the ROW and wild lupine populations would decline, and therefore would result in a loss of KBB.

7.2 Alternative 1: No Change from historic maintenance plan

Perform electric, gas, and water line construction, maintenance, and emergency work, and vegetation management at any time during the year, disregarding the life cycle or habitat of the Karner blue butterfly.

This alternative would result in habitat destruction, with no provision for habitat improvements; this would result in a reduction of habitat below the 2004 Baseline level. This alternative has too many

circumstances, which would result in a take, or habitat destruction; therefore, it is unacceptable.

7.3 Alternative 2: Proposed Action Alternative (Preferred Alternative)

This alternative focuses on the protection and improvement of potential and existing Karner Blue Butterfly habitat on 84 acres of NIPSCO owned ROW, and 2 acres of INAWC ROW, as described in section 5.0. The baseline level of KBB habitat established in 2004 is 4.244 acres. To minimize impacts to the KBB and its habitat, no maintenance shall be planned to take place on ROW included in this plan, from April through August, unless it can be demonstrated that the resulting habitat destruction would not reduce the total KBB habitat below the 2004 Baseline level of 4.244 acres. Habitat areas will be staked and efforts will me made to limit the impacts those areas that absolutely cannot be avoided.

Emergency work may take place anywhere and at any time during the year, however all attempts must be made to avoid impact to KBB and their habitat.

HCP compliance training will be offered on an annual basis. All NIPSCO employees who may participate in any level of a project proposed to take place in the plan area will be trained.

Since this plan focuses on habitat improvement, an increase in habitat would allow for temporary destruction of portions of the habitat without threatening the 2004 habitat baseline level. For example, the most destructive work that would take place on the ROW would be replacing all of the underground pipelines at the same time. This would result in the loss of about 1.5 acres of KBB habitat that was recorded as part of the 2004-baseline. Included in the plan area is a 12.85-acre mitigation site that will be managed for KBB habitat only. It is estimated that 9 acres of this 12.85-acre area can be successfully restored to lupine habitat. There are also an additional 42 remaining acres that contain power lines but no underground pipelines and which would be managed for KBB habitat. It is also estimated that between 30 and 35 acres of lupine habitat is restorable in these 42 acres. Therefore, there would be a huge buffer to ensure that under even the worst possible circumstances, (required replacement of all underground pipelines simultaneously); a sufficient amount of wild lupine will exist in the plan area to ensure that the 2004 baseline level is not reached.

The only potential for the 2004 habitat to be compromised would be habitat destruction resulting from emergency work prior to habitat improvement and the spread of the KBB.

With the exception of emergency work resulting in habitat destruction prior to habitat improvements, this alternative avoids any foreseeable situation where a take below the 2004 baseline level may be possible; therefore it is the desired alternative.

8.0 PLAN IMPLEMENTATION, UNFORSEEN CIRCUMSTANCES

8.1 Plan implementation

Upon acceptance of this plan, the maintenance restrictions for ROW listed within this plan will be implemented immediately. HCP training will be incorporated into normal training schedules. The habitat improvement plans will be completed as described in section 5.

8.2 Unforeseen Circumstances

"Unforeseen circumstances" are changes in circumstances affecting the KBB or its habitat covered by the HCP that could not reasonably have been anticipated by the plan developers at the time of the HCP's development and that result in a substantial and adverse change in the status of the KBB. "Unforeseen circumstances" would include natural disasters of a scale or magnitude not anticipated under normal circumstances, such as wildfire of unanticipated size, an earthquake or other catastrophic event not normally expected to occur. Pursuant to the rule, the USFWS will determine whether an "unforeseen circumstance" has occurred, and if such occurs, the Service will work cooperatively with NIPSCO and INAWC on conservation measures (if needed) to address the impacts. However, any conservation measures identified will be limited to the HCP's operation program and will not include more lands, financial compensation, or additional restrictions on land use or other natural resources otherwise available for development or use without the consent of NIPSCO, NiSource Environmental Health and Safety Department, and INAWC

The Parties acknowledge that liability for violations of the ESA incorporate ordinary requirements of proximate causation and foreseeability, including with regard to acts of third parties.

8.3 Implementing Agreement

An Implementing Agreement between NIPSCO, the US Fish and Wildlife Service, and INAWC has been developed and is attached as appendix D to the Plan.

9.0 LITERATURE CITED

[1] US Fish and Wildlife Service, 2001 Karner Blue Butterfly (*Lycaeides Melissa samuelis*) Technical/Agency Draft Recovery Plan, Fort Snelling, Minnesota

[2] Wisconsin Department of Natural Resources, 1999, Wisconsin Statewide Karner Blue Butterfly Habitat Conservation Plan and Environmental Impact Statement, Madison Wisconsin

[3] JF New and Associates, 2004 Baseline Monitoring Report, NiSource, Wild Lupine and Karner Blue Butterfly Survey, Lake and Porter Counties, Indiana

[4] US Environmental Protection Agency, 1995, The Great Lakes, An environmental atlas and Resource Book, Chicago, Illinois

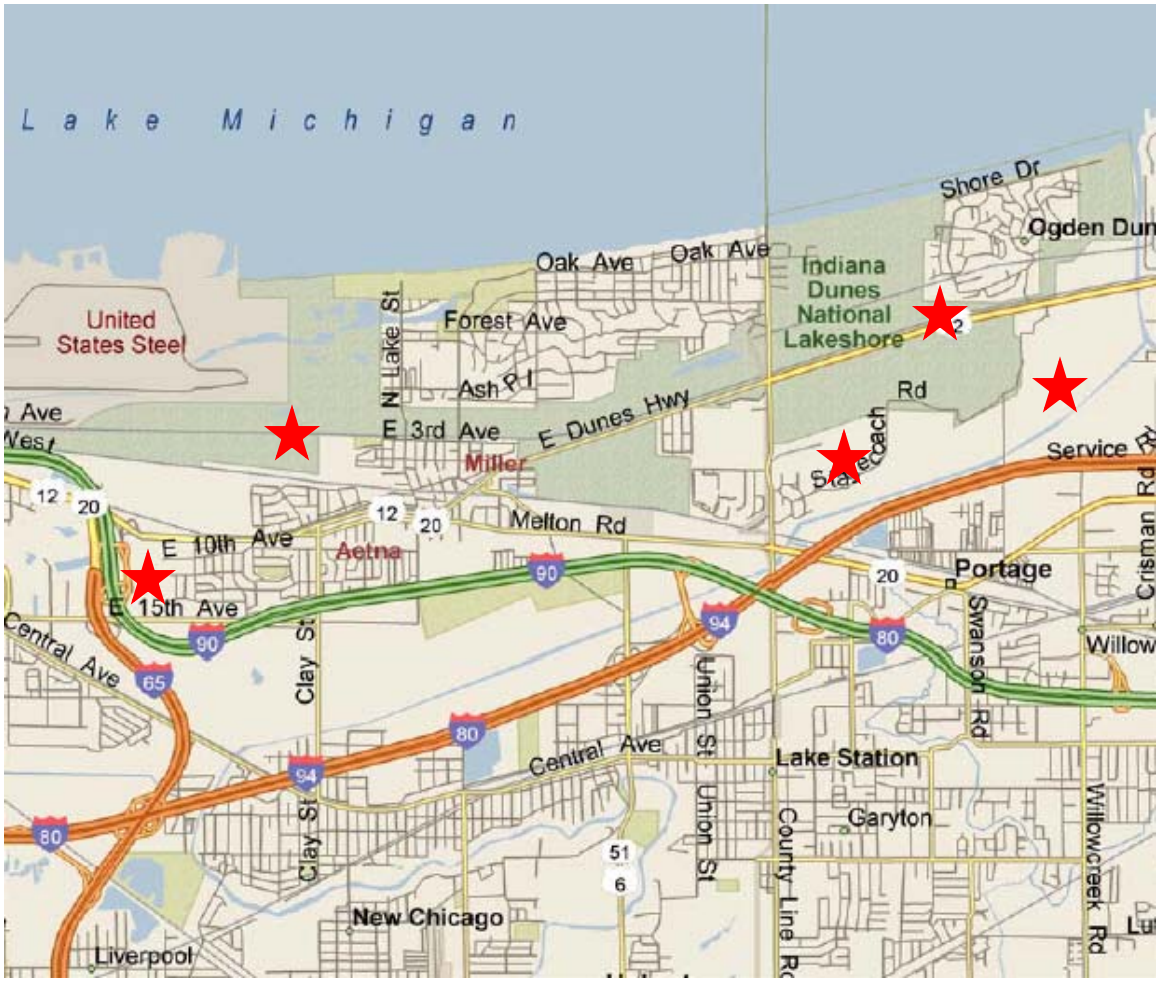
[5] www .state.in.us/nrc_dnr/lakemichigan/natural/natural1.html

[6] Bacone, John A., 1979, Shell Oil Dune and Swale, A Report On A Natural Area. Division of Nature Preserves, IDNR, Indianapolis, Indiana

[7] USDA 1981 Soil Survey of Porter County, Indiana, Soil Conservation Service, Purdue University

APPENDIX A:

MAPS / FIGURES



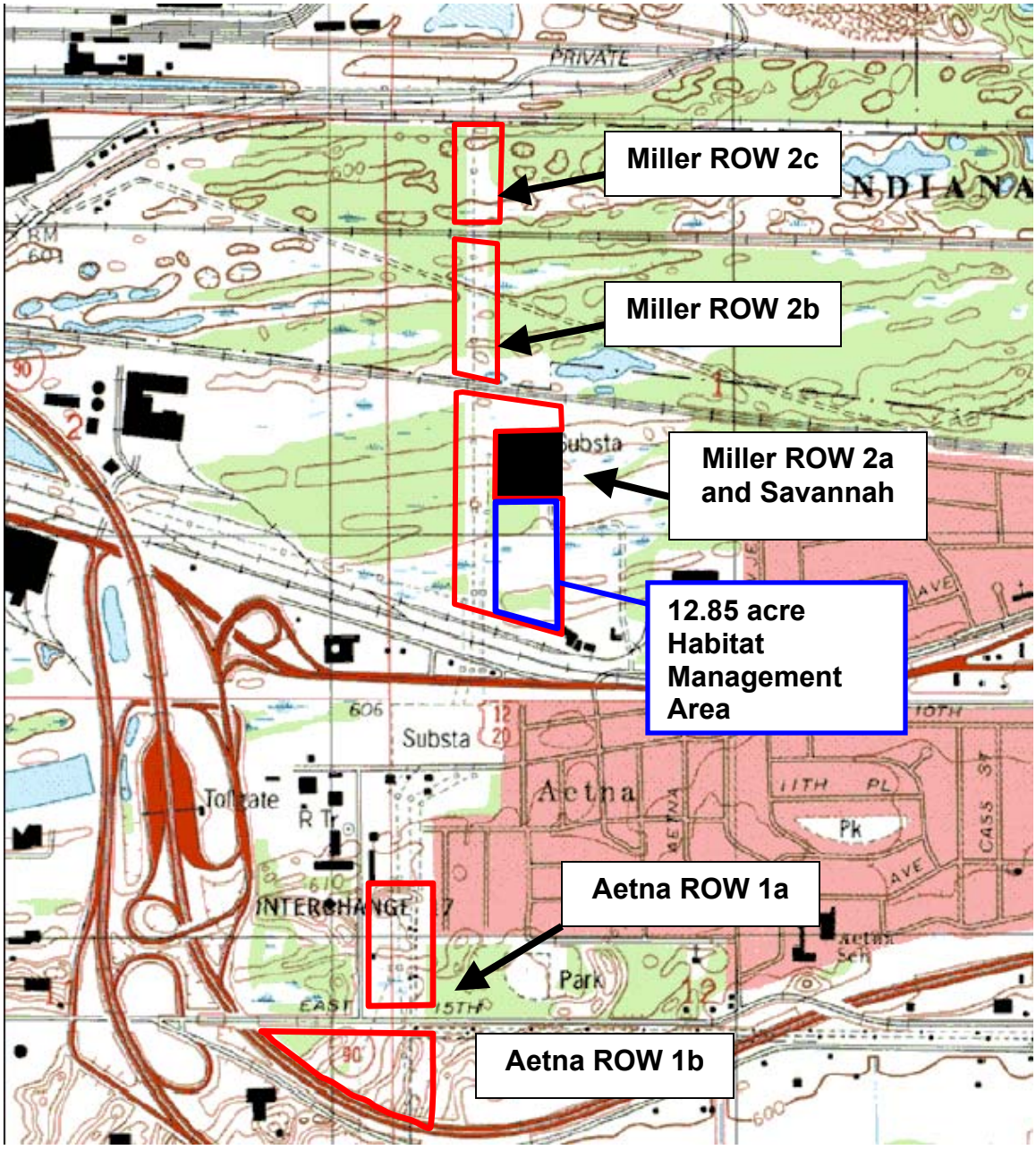
NIPSCO KBB HCP Plan Area ROW Locations

NIPSCO

A NiSource Company

Plan Area Locations
Karner Blue Butterfly HCP
Northern Indiana Public Service Company

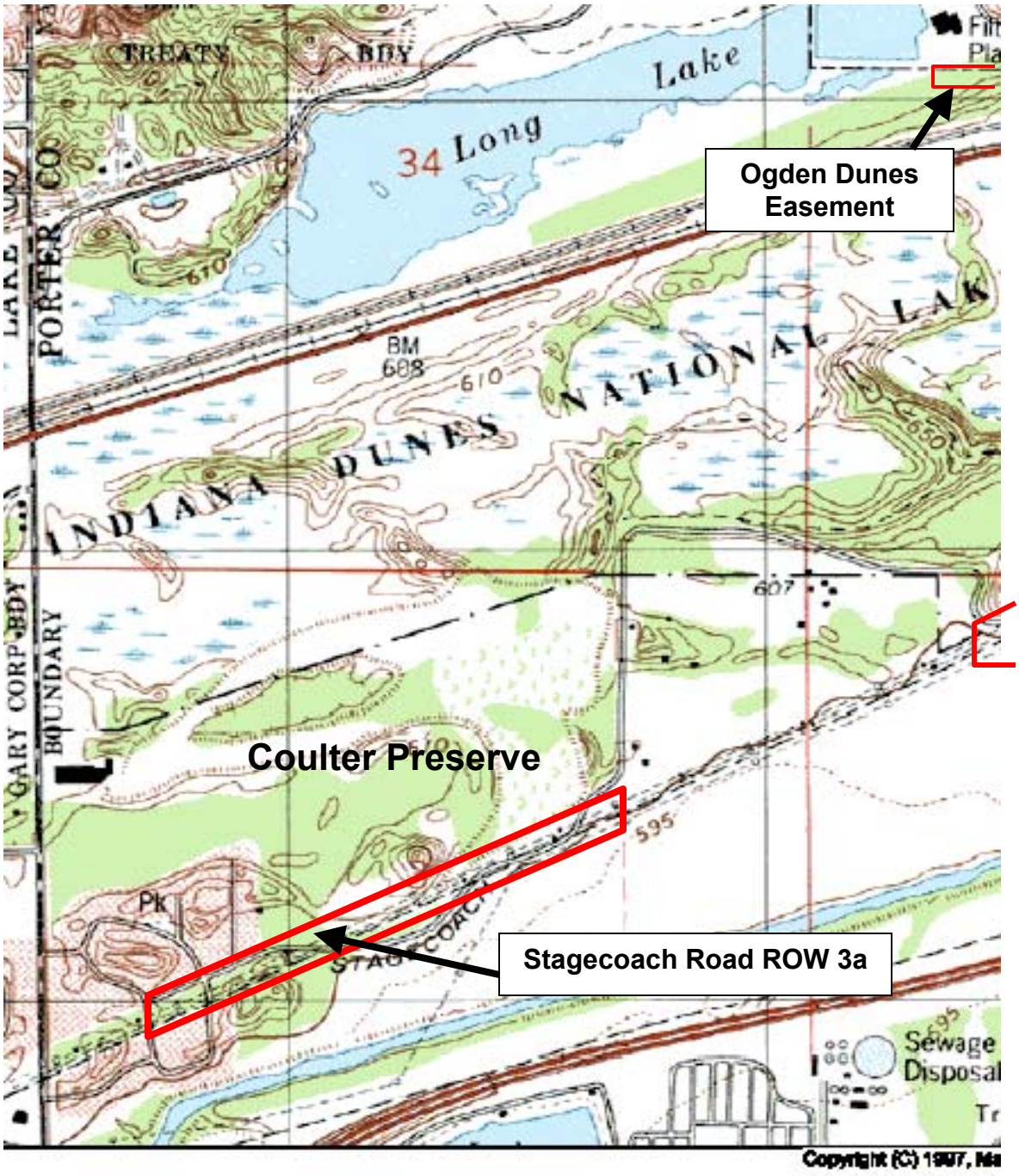
Figure 1



NIPSCO
A NiSource Company

Aetna & Miller ROW Locations
Northern Indiana Public Service Company
Karner Blue Butterfly
Habitat Conservation Plan

Figure 2

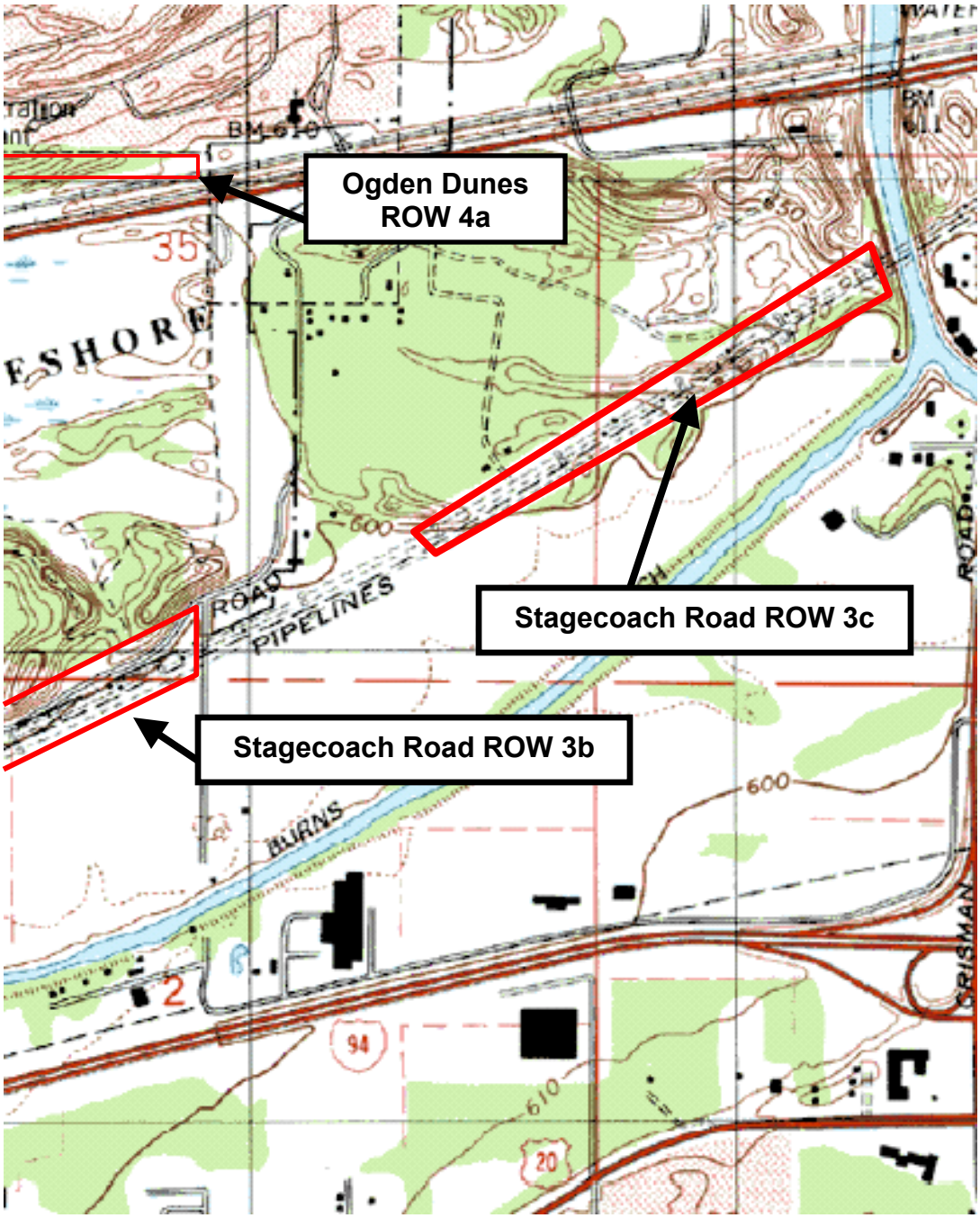


NIPSCO

A NiSource Company

Stagecoach Road & Ogden Dunes ROW
Northern Indiana Public Service Company
Habitat Conservation Plan for the
Karner Blue Butterfly

Figure 3a

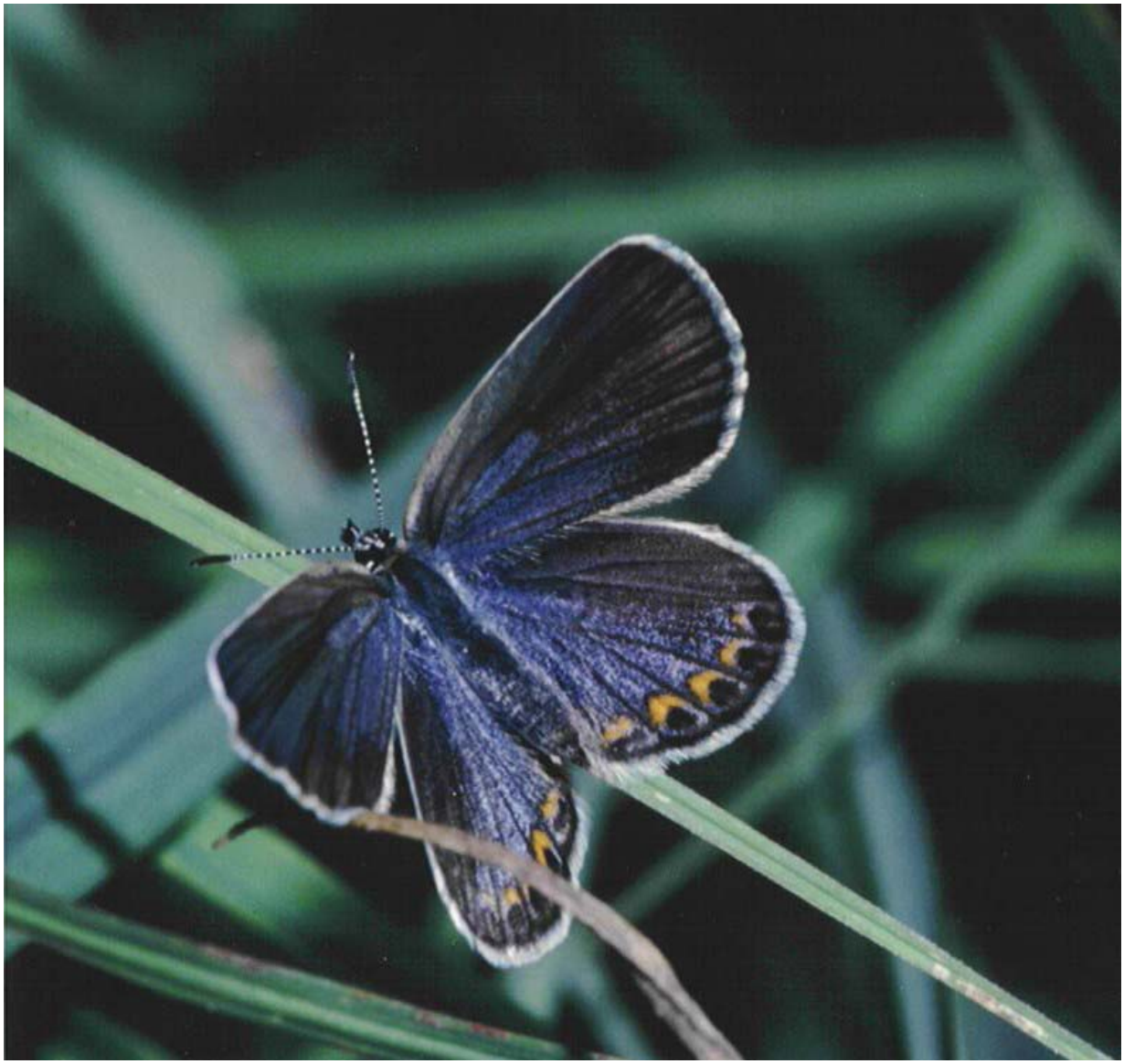


NIPSCO

A NiSource Company

Stagecoach Road & Ogden Dunes ROW
Northern Indiana Public Service Company
Habitat Conservation Plan for the
Karner Blue Butterfly

Figure 3b



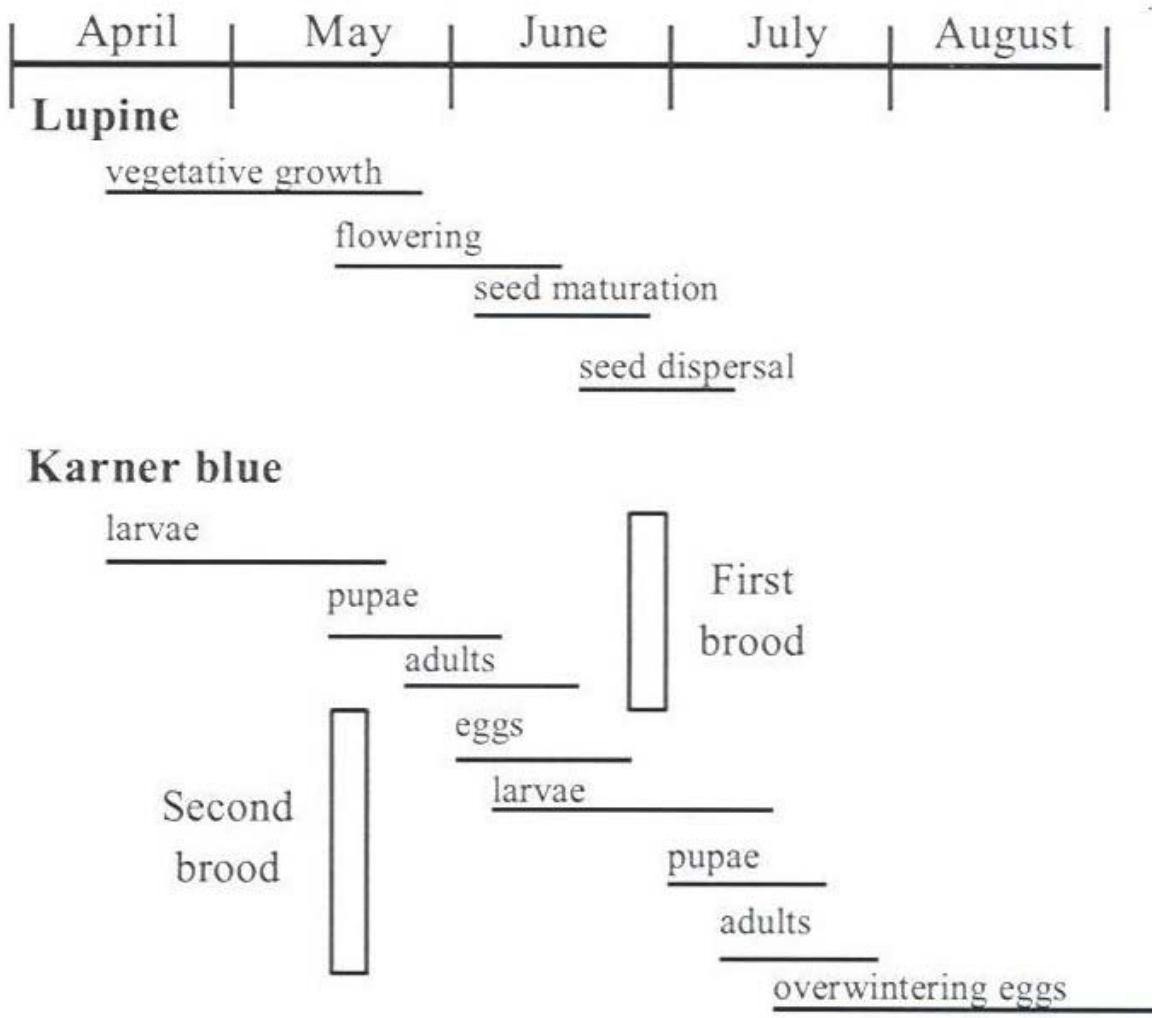
NIPSCO

A NiSource Company

Karner Blue Butterfly

Figure 4

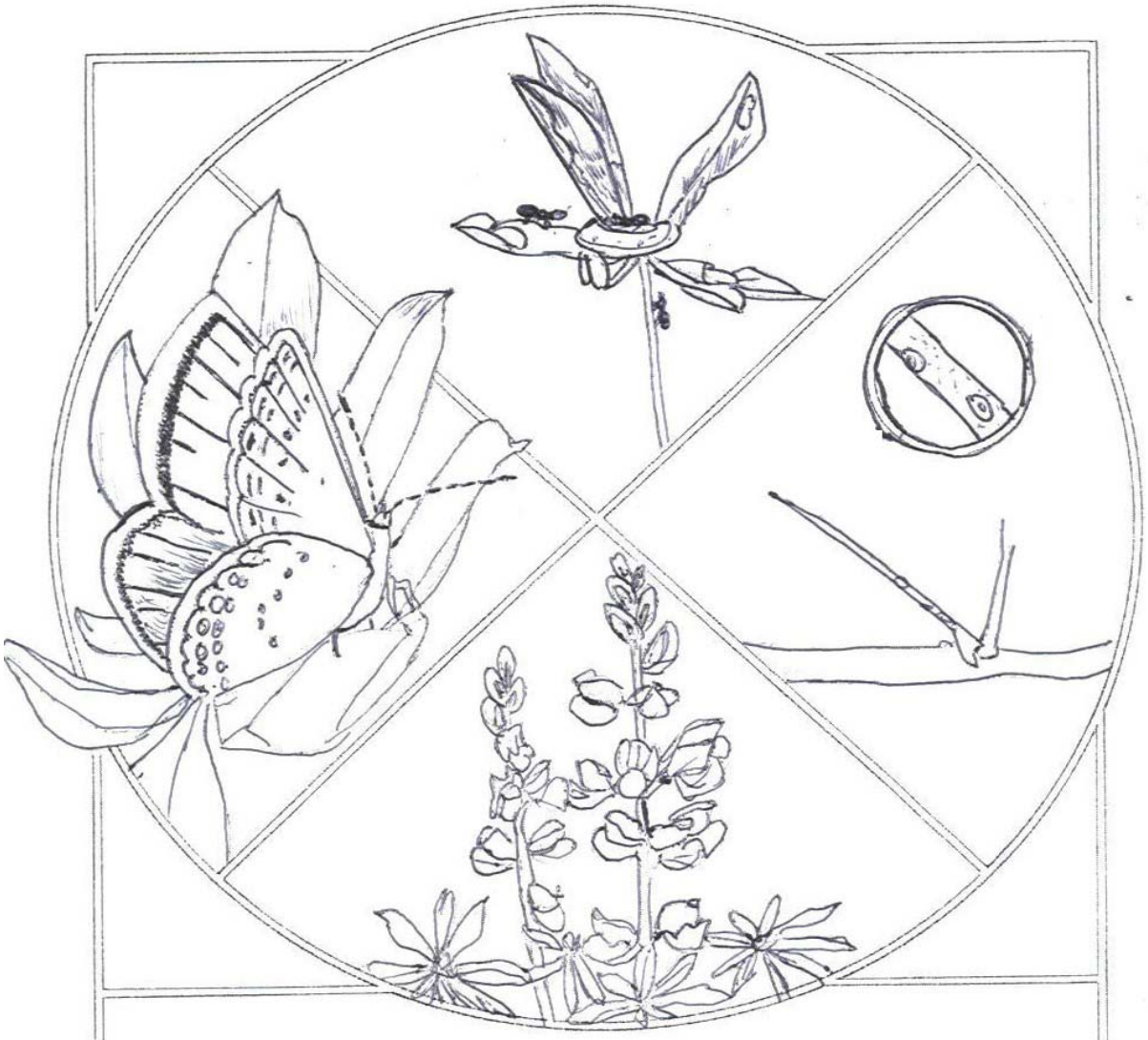
Phenology of the Karner blue and lupine. In colder (warmer) areas and years phenologies will be delayed (advanced).



Phenology of the Karner Blue Butterfly & Wild Lupine

NIPSCO
A NiSource Company

Figure 5



Karner Blue Butterfly Life History: The Karner blue butterfly produces two broods of young each year, a spring brood and a summer brood. Larvae emerge in April from eggs that have overwintered and feed on wild lupine, Lupinus perennis, the only known larval food plant of the butterfly. The larvae are often attended by ants, which collect a sugary solution secreted by the larvae, and in turn may protect the larvae from predation and/or parasitism. Near the end of May, the larvae pupate and adults emerge in late May or early June. The butterfly then mates and lays eggs on the lupine plant. The second brood of butterflies emerge mid-July to early August. Their eggs overwinter to hatch again in April.

Karner Blue Butterfly Life Cycle

NIPSCO

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Figure 6

NIPSCO

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Wild Lupine

Figure 7a

NIPSCO

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Wild Lupine

Figure 7b

Karner Blue Butterfly Nectar Species On NIPSCO HCP ROW

Scientific Name	Common Name
Amorpha canescens	Lead plant
Apocynum spp.	Dogbane
Arabis lyrata	Sand Cress
Asclepias tuberosa	Butterfly weed
Asclepias verticillata	Whorled milkweed
Bertotoa incana	Hoary alyssum
Ceanothus americanus	New Jersey tea
Chrysanthemum leucanthemum pinnatifidum	Ox-eye daisy
Coreopsis spp.	Coreopsis
Euphorbia corollata	Flowering spurge
Helianthus occidentalis	Western sunflower
Heiracium aurantiacum	Orange Hawkweed
Liatris spp.	Blazing star
Lithospermum spp.	Puccoon
Melilotus spp.	Sweet clover
Monarda punctata	Horsemint
Potentilla simplex	Common cinquefoil
Rubus spp.	Blackberry Dewberry Raspberry
Rudebeckia hirta	Black Eye Susan
Solidago speciosa	Showey goldenrod

A NiSource Company

Karner Blue Nectaring Species

Figure 8

WILDLIFE HABITAT

MANAGEMENT AREA

Contact NiSource Environmental Health and Safety Department prior to any activities

NIPSCO

A NiSource Company

Habitat Management area sign

Figure 9a

WILDLIFE HABITAT MANAGEMENT AREA

Contact Indiana-American Water Company

219-886-3770 prior to any activities

NIPSCO

A NiSource Company

Habitat Management Area Sign

Figure 9b

APPENDIX B:

2004 BASELINE MONITORING REPORT BY JF NEW

2004 Baseline Monitoring Report

NiSource

Wild Lupine and Karner Blue Butterfly Survey
Lake and Porter Counties, Indiana

October 15, 2004

Prepared for:

NiSource

801 East 86th Avenue
Merrillville, Indiana 46410
219-647-5273

Prepared by:

JFNew

708 Roosevelt Road
Walkerton, Indiana 46574
574-586-3400

2004 Baseline Monitoring Report

NiSource

Wild Lupine and Karner Blue Butterfly Survey

TABLE OF CONTENTS

2004 Baseline Monitoring Report
NiSource
Wild Lupine and Karner Blue Butterfly Survey
Lake and Porter Counties, Indiana

I. Introduction

This report was prepared for NiSource to provide baseline information on the presence of wild lupine (*Lupinus perennis* var. *occidentalis*) and Karner blue butterflies (*Lycaeides melissa* var. *samuelis*) within several NiSource rights-of-way (ROWs) at four project sites. The project sites are located in Lake and Porter Counties, Indiana (Figure 1). The wild lupine and Karner blue butterfly surveys took place within two areas of the Aetna ROW (Aetna A and Aetna B) (Figure 2), one area along the Odgen Dunes ROW (Figure 3), three areas of the Miller ROW and Substation (Miller A, Miller B, and Miller C) (Figure 4) and three areas of the Stagecoach Road ROW (Stagecoach A, Stagecoach B, and Stagecoach C) (Figure 3). A total of approximately 86 acres of ROW were surveyed for wild lupine populations and Karner blue butterflies.

The baseline monitoring survey was conducted in order to determine the number and size of wild lupine and Karner blue butterfly populations within the study areas prior to habitat enhancement taking place. Typical wild lupine habitat consisting of open woods and savannas in sandy soils was noted throughout the study area. Wild lupine populations and available nectar species within existing open woods and savannas were also noted as potential Karner blue butterfly habitat. Suggested habitat improvements including the removal of exotics, seeding of lupine, and some thinning of woods to restore savanna conditions were also noted. Future lupine population monitoring inspections will be compared to the current survey results to determine whether the wild lupine populations are increasing or decreasing within the study areas. Future Karner blue butterfly surveys can be compared to this survey to determine whether wild lupine population enhancements are impacting Karner blue butterfly populations within the study areas.

II. Methodology

A. Wild Lupine and Karner Blue Butterfly Nectar Species

The baseline monitoring inspection for wild lupine was completed on June 23, 24, and 25, 2004. In order to note the presence of all wild lupine populations within each site, each site was walked from one end to the other in a zigzag pattern with approximately 20 to 50 feet between zigzags. Investigators then walked back to the starting point in the same manner. Results from previous wild lupine surveys within the project areas were used to assist in finding each wild lupine population. At each observed wild lupine population, the boundaries of the population were surveyed. In addition, boundary points along the ROWs were surveyed. Boundaries and points were surveyed using a Trimble Global Positioning System (GPS) with a Pro XRS receiver. This receiver

provides approximately one-meter accuracy with every point reading. Field surveys were scheduled to correspond with appropriate satellite geometry to maintain accuracy parameters. Satellite readings were real time corrected with land-based transponders to eliminate the effects of selective availability.

In addition to the GPS survey of each population, notes were taken on the size of each population, abundance and distribution of wild lupine within each population, additional species within populations, and any ecological observations regarding the populations. Notes were also compiled regarding the presence of the following Karner blue butterfly nectar species[1-6] listed in Table 1.

Table 1. Karner blue butterfly nectar species.

Scientific Name	Common Name
Amorpha canescens	Lead plant
Apocynum spp.	Dogbane
Arabis lyrata	Sand cress
Asclepias tuberosa	Butterfly weed
Asclepias verticillata	Whorled milkweed
Berteroa incana	Hoary alyssum
Ceanothus americanus	New Jersey tea
Chrysanthemum leucanthemum pinnatifidum	Ox-eye daisy
Coreopsis spp.	Coreopsis
Euphorbia corollata	Flowering spurge
Helianthus occidentalis	Western sunflower
Hieracium aurantiacum	Orange hawkweed
Liatris spp.	Blazing star
Lithospermum spp.	Puccoon
Melilotus spp.	Sweet clover
Monarda punctata	Horse mint
Potentilla simplex	Common cinquefoil
Rubus spp.	Blackberry/dewberry/raspberry
Rudbeckia hirta	Black-eyed Susan
Solidago speciosa	Showy goldenrod

Finally, notes were made on whether appropriate habitat for wild lupine or Karner blue butterfly nectar species is available within the subject ROWs.

B. Karner Blue Butterflies

The baseline monitoring inspection for Karner blue butterflies was completed on June 2, July 3, July 19, and July 28. The baseline Karner blue butterfly monitoring surveys were conducted in order to determine the presence or absence of Karner blue butterflies within the study areas prior to the proposed habitat enhancement activities. Karner blue butterfly surveys followed the Wisconsin Department of Natural Resources (DNR) Level 2 Karner blue butterfly presence/absence survey protocol as detailed in the Wisconsin Statewide Karner Blue Butterfly Habitat Conservation Plan: Appendix G. (Appendix B

contains a copy of this protocol.) Field surveying was scheduled during both the first and second broods. Field surveys were conducted under the following conditions: observations between 8 a.m. and 6 p.m., temperatures greater than 60 °F, low cloud cover and little wind if temperatures are greater than 60 °F but less than 70 °F, winds less than 20 miles per hour, and no rain or drizzly conditions.

A total of three surveys were conducted on the four ROWs. The first survey occurred during the first Karner blue butterfly brood on June 2 and 3. During this visit, each site was walked from one end of the ROW to the other in a zigzag pattern spaced approximately 50 feet apart. When Karner blue butterflies were observed, their location was recorded using a Trimble GPS with a Pro XRS receiver. The Karner blue butterfly's sex and physical condition were also noted. Karner blue butterflies were noted in one direction only, any Karner blue butterflies observed walking back along the ROW were not recorded. Sites were Karner blue butterflies were observed during the first brood were not revisited during the second brood. During the second visit conducted on July 19, instead of walking the entire road ROW, only the areas where wild lupine occurs were surveyed. Each wild lupine population recorded during the wild lupine survey was walked in a zigzag pattern for a minimum of 10 minutes per acre of wild lupine or until a Karner blue butterfly was observed. Again, if a Karner blue butterfly was observed, then the area was not revisited during the third survey. The third survey conducted on July 28 followed the same protocol as the second survey.

III. Results

A. Wild Lupine and Karner Blue Butterfly Nectar Species

The result of the wild lupine GPS survey can be found in Appendix C. Appendix D contains notes on each of the observed wild lupine populations. Photos of representative wild lupine populations, Karner blue butterflies, and representative locations throughout the study area (Appendix E)

Aetna ROW A (Appendix A Sheet 1; Appendix C Page 1) consisted of a large dune at the north end, with a general decline in elevation towards the southern end of the site. A large cattail (*Typha* spp.) -dominated wetland was present at the southern end of the ROW, and a small cattail-dominated wetland was present on the west side of the ROW just north of the center of the property. These wetland areas were not wild lupine or Karner blue butterfly habitat, but the remainder of the site appeared to contain habitat for both wild lupine and Karner blue butterflies. A portion of the southern end of the site was upland area has been consistently mowed, and another area is an upland area dominated by shrubby vegetation. Although no wild lupine was found in these areas, nectar species and species commonly associated with wild lupine were found in these areas. Therefore, these areas were potential wild lupine habitat. Portions of the study area were dominated by undesirable and invasive species of vegetation observed included quack grass (*Agropyron repens*), Japanese chess (*Bromus japonicus*), downy brome (*Bromus tectorum*), Canada thistle (*Cirsium arvense*), horseweed (*Erigeron canadensis*), tall fescue (*Festuca elatior*), Morrow's honeysuckle (*Lonicera morrowii*),

honeysuckle (*Lonicera* sp.), Kentucky blue grass (*Poa pratensis*), quaking aspen (*Populus tremuloides*), and glossy buckthorn (*Rhamnus frangula*). Eight wild lupine populations totaling 0.48 acre were observed within Aetna ROW A. Karner blue butterfly nectar species including dogbane (*Apocynum cannabinum*), sand cress, butterfly weed, sand coreopsis (*Coreopsis lanceolata*), tall coreopsis (*Coreopsis tripteris*), flowering spurge, western sunflower, rough blazing star (*Liatris aspera*), hairy puccoon (*Lithospermum croceum*), white sweet clover (*Melilotus alba*), horse mint, blackberry/dewberry/raspberry, black-eyed Susan, and showy goldenrod were observed throughout the upland portions of the site, with the most common nectar species being flowering spurge, hairy puccoon, horse mint, and blackberry/dewberry/raspberry. It should also be noted that the State Rare dwarf honeysuckle (*Diervilla lonicera*) was observed on the site.

Aetna ROW B (Appendix A Sheet 2; Appendix C Page 2) consisted of several large dunes and two wetland areas. The western side of this study area was a large forested wetland, and a small wetland was present in the center of the southern site boundary. These wetland areas were not wild lupine or Karner blue butterfly habitat, but the remainder of the site appeared to be habitat for both wild lupine and Karner blue butterflies. The majority of the non-wetland portion of this study area was dominated by undesirable and invasive species of vegetation including quack grass, Hungarian brome (*Bromus inermis*), downy brome, hardy catalpa (*Catalpa speciosa*), orange day lily (*Hemerocallis fulva*), Morrow's honeysuckle, white sweet clover, Canada blue grass (*Poa compressa*), Kentucky blue grass, glossy buckthorn, bouncing bet (*Saponaria officinalis*), and Siberian elm (*Ulmus pumila*). No wild lupine was observed within Aetna ROW B. Karner blue butterfly nectar species including dogbane, sand cress, butterfly weed, flowering spurge, hairy puccoon, white sweet clover, horse mint, and blackberry/dewberry/raspberry were observed throughout the non-wetland portions of the site, with the most common nectar species being flowering spurge, hairy puccoon, horse mint, and blackberry/dewberry/raspberry.

Ogden Dunes ROW (Appendix A Sheet 3; Appendix C Page 2) consisted mostly of level topography, as the majority of the ROW is located on the top of a dune. A small portion of the ROW at the west end consists of a swale wetland, and this portion of the ROW was not wild lupine or Karner blue butterfly habitat. The remainder of the site is potential wild lupine and Karner blue butterfly habitat, although wild lupine was only found within the eastern half of the ROW. Within the western half of the ROW, an adjacent homeowner had consistently mowed a portion of the ROW, and other areas within the ROW are overgrown with wild black cherry (*Prunus serotina*), black oak, black locust, and sassafras. The undesirable and invasive species downy brome, ground ivy (*Glechoma hederacea*), Morrow's honeysuckle, Kentucky blue grass, black locust, multiflora rose (*Rosa multiflora*), and bouncing bet were observed within this study area. Three wild lupine populations totaling 0.56 acre were observed within the Ogden Dunes ROW. These populations all continued off-site to the north and south. Karner blue butterfly nectar species including sand cress, butterfly weed, whorled milkweed, prairie coreopsis (*Coreopsis palmata*), flowering spurge, rough blazing star, hairy puccoon, white sweet clover, horse mint, common cinquefoil, blackberry/dewberry/raspberry,

black-eyed Susan, and showy goldenrod were observed throughout the non-wetland portions of the site. Of these species, the most common nectar species were butterfly weed, hairy puccoon, horse mint, and showy goldenrod.

Miller ROW and Substation A (Appendix A Sheet 4; Appendix C Page 3-5) consisted of a ROW, substation, and associated forested areas that exhibit dune/swale topography. Three large wetland areas were observed in the swale portions of this study area (north, center, and south). Additionally, a small wetland swale was noted in the southeastern corner of the ROW. An area dominated by gravelly substrate and weedy vegetation was also present in the extreme southeast corner of the site. These wetland and weedy areas were not wild lupine or Karner blue butterfly habitat, but the remainder of the site appeared to be habitat for both wild lupine and Karner blue butterflies. Within the portion of the study area located directly south of the substation, the majority of the woody individuals, including honeysuckle, black oak (*Quercus velutina*), sassafras (*Sassafras albidum*), and blueberry (*Vaccinium* spp.) had recently been killed. Dead and dying trunks and stems of these plants were still in place. The undesirable and invasive species quack grass, tree-of-heaven (*Ailanthus altissima*), Japanese chess, downy brome, oriental bittersweet (*Celastrus orbiculatus*), Canada thistle, Morrow's honeysuckle, Tartarian honeysuckle (*Lonicera tatarica*), sweet clover, wild four o'clock (*Mirabilis nyctaginea*), Canada blue grass, Kentucky blue grass, glossy buckthorn, black locust (*Robinia pseudoacacia*), and bouncing bet were observed within upland portions of this study area. In addition, several areas were being to be overgrown by woody species such as black oak and sassafras that ranged from 1-2 inches in diameter at breast height (DBH). Twenty-five wild lupine populations totaling 1.01 acres were observed within Miller ROW and Substation A. Some of these populations continued off-site to the east or west. Karner blue butterfly nectar species including spreading dogbane (*Apocynum androsaemifolium*), dogbane, sand cress, butterfly weed, whorled milkweed, New Jersey tea, sand coreopsis, tall coreopsis, flowering spurge, rough blazing star, hairy puccoon, sweet clover, horse mint, common cinquefoil, blackberry/dewberry/raspberry, black-eyed Susan, and showy goldenrod were observed throughout the non-wetland portions of the site. Of these species, the most common nectar species were butterfly weed, sand coreopsis, flowering spurge, and showy goldenrod. It should also be noted that the State Rare dwarf honeysuckle and the State Rare pin cherry (Prunus *pensylvanica*) were observed on the site.

Miller ROW and Substation B (Appendix A Sheet 5; Appendix C Page 5-6) consisted of a ROW exhibiting dune/swale topography. Two wetland areas were observed, one near the north end of the study area, and one along the southern end of the study area. These wetland areas were not wild lupine or Karner blue butterfly habitat, but the remainder of the site appeared to be habitat for both wild lupine and Karner blue butterflies. The undesirable and invasive species Hungarian brome, musk thistle (*Carduus nutans*), Morrow's honeysuckle, Tartarian honeysuckle, Canada blue grass, and Kentucky blue grass were observed within this study area. In addition, several areas were being overgrown by 1-2 inch DBH woody species such as black oak and sassafras. Seven wild lupine populations totaling 0.44 acre were observed within Miller ROW and Substation B. Some of these populations continued off-site to the east or

west. Karner blue butterfly nectar species including sand cress, butterfly weed, New Jersey tea, sand coreopsis, tall coreopsis, flowering spurge, rough blazing star, hairy puccoon, horse mint, blackberry/dewberry/raspberry, black-eyed Susan, and showy goldenrod were observed throughout the non-wetland portions of the site. Of these species, the most common nectar species were sand cress, butterfly weed, tall coreopsis, flowering spurge, and hairy puccoon. It should also be noted that the State Rare dwarf honeysuckle was observed on the site.

Miller ROW and Substation C (Appendix A Sheet 6; Appendix C Page 6) consisted of a ROW exhibiting dune/swale topography. A wetland was observed in a swale at the southern end of the study area. This wetland area was not wild lupine or Karner blue butterfly habitat, but the remainder of the site appeared to be habitat for both wild lupine and Karner blue butterflies. The undesirable and invasive species Morrow's honeysuckle, white sweet clover, and Canada blue grass were observed within this study area. Several areas within the study area were being overgrown by 1-2 inch DBH woody species such as black oaks. Three wild lupine populations totaling 1.28 acres were observed within Miller ROW and Substation C. Some of these populations continued off-site to the east or west. Karner blue butterfly nectar species including butterfly weed, whorled milkweed, New Jersey tea, sand coreopsis, flowering spurge, hairy puccoon, white sweet clover, horse mint, and black-eyed Susan were observed throughout the non-wetland portions of the site, with the most common nectar species being hairy puccoon and horse mint.

Stagecoach Road ROW A (Appendix A Sheet 7; Appendix C Page 7) consisted of fairly level topography with a few large dunes interspersed. One wet meadow wetland was observed between Stagecoach Road and Pershing Road. This wetland area was not wild lupine or Karner blue butterfly habitat, but the remainder of the site appeared to be habitat for both wild lupine and Karner blue butterflies. Portions of the study area, particularly the western portion, were dominated by undesirable species of vegetation including quack grass, garlic mustard (*Alliaria petiolata*), Hungarian brome, Japanese chess, downy brome, ground ivy, sweet clover, Canada blue grass, Kentucky blue grass, and bouncing bet. Seven wild lupine populations totaling 0.27 acre were observed within Stagecoach Road ROW A. Characteristic "window paning" by Karner blue butterflies was observed on some wild lupine leaves. Karner blue butterfly nectar species including sand cress, butterfly weed, sand coreopsis, tall coreopsis, flowering spurge, rough blazing star, marsh blazing star (*Liatris spicata*), hairy puccoon, sweet clover, horse mint, blackberry/dewberry/raspberry, black-eyed Susan, and showy goldenrod were observed throughout the non-wetland portions of the site, with the most common nectar species being hairy puccoon and blackberry/dewberry/raspberry.

Stagecoach Road ROW B (Appendix A Sheet 8; Appendix C Page 8) consisted of a portions of a steep dune north of Stagecoach Road dropping down to wet meadow and agricultural fields south of Stagecoach Road. The wetland and agricultural areas were not wild lupine or Karner blue butterfly habitat, but the remainder of the site appeared to be habitat for both wild lupine and Karner blue butterflies. Portions of the study area were dominated by undesirable and invasive species of vegetation including Hungarian

brome, Japanese chess, downy brome, oriental bittersweet, Kentucky blue grass, bouncing bet, and white stonecrop (*Sedum album*). Four wild lupine populations totaling 0.12 acre were observed within Stagecoach Road ROW B. One of these populations continues off-site to the north. Karner blue butterfly nectar species including flowering spurge, hairy puccoon, sweet clover, horse mint, and blackberry/dewberry/raspberry were observed throughout the non-wetland portions of the site, with the most common nectar species being blackberry/dewberry/raspberry.

Stagecoach Road ROW C (Appendix A Sheet 9; Appendix C Page 8) consisted of several steep dunes interspersed amongst gently rolling topography. The majority of the site appeared to be habitat for both wild lupine and Karner blue butterflies. Undesirable and invasive species of vegetation including quack grass, garlic mustard, Hungarian brome, Japanese chess, downy brome, orange day lily, Morrow's honeysuckle, Tartarian honeysuckle, sweet clover, Kentucky blue grass, and black locust were dominant throughout much of the study area. Three wild lupine populations totaling 0.08 acre were observed within Stagecoach Road ROW C. One of these populations continued off-site to the south. Karner blue butterfly nectar species including sand cress, butterfly weed, sand coreopsis, flowering spurge, hairy puccoon, sweet clover, horse mint, common cinquefoil, and blackberry/dewberry/raspberry were observed throughout the site, with the most common nectar species being flowering spurge and hairy puccoon. It should also be noted that the State Threatened false heather (*Hudsonia tomentosa*) was observed on the site.

B. Karner Blue Butterflies

The results of the Karner blue butterfly surveys can be found in Appendix D Sheets 1-9. All surveys were conducted when weather conditions met the Wisconsin DNR requirements (Table 2). In total, fifteen surveys were conducted in the nine areas resulting in twenty-two Karner blue butterfly observations (Table 3). The majority of observations occurred within the Miller ROW where 10 Karner blue butterflies were observed within the three parcels (Appendix D Sheets 4-6, Table 3). All of these observations occurred during the first brood. Additional Karner blue butterflies were observed on adjacent properties during the site visit to the Miller ROW. The large, contiguous wild lupine populations and available nectar species along this ROW provide ample habitat and forage for adult Karner blue butterfly feeding and reproduction. Likewise, the contiguous wild lupine population surrounded by forest along the eastern end of the Ogden Dunes ROW provides ideal Karner blue butterfly habitat. Five Karner blue butterflies were observed within this site during the first brood (Appendix D Sheet 3, Table 3).

During the second brood survey, four Karner blue butterflies were observed at Stagecoach A, B, and C and two Karner blue butterflies were observed at Aetna A (Appendix D Sheets 1, and 7-9, Table 3). Smaller, less contiguous wild lupine populations provide habitat at the Stagecoach and Aetna A ROW sites. The lack of leaf cover and discontinuity of wild lupine population may limit the ability of Karner blue butterfly eggs to over winter within the Stagecoach and Aetna A parcels. Nevertheless,

available nectar species at these sites attract adult Karner blue butterflies during the first brood and encourage them to lay eggs on the available wild lupine.

Karner blue butterflies were not observed during any of the three surveys conducted at Aetna B ROW (Appendix D Sheet 2, Table 3). The lack of wild lupine and nectar species limits reproductive opportunities at Aetna B ROW. Habitat is not available at this parcel for adult Karner blue butterflies to feed or reproduce.

Table 2. Weather conditions recorded during Karner blue butterfly surveys.

Survey Date	Weather Conditions
June 2, 2004	Partly sunny, temperatures around 60 °F, winds 5 to 10 miles per hour
June 3, 2004	Sunny, temperatures around 70 °F, winds 10 to 15 miles per hour
July 19, 2004	Sunny, temperatures 75 to 85 °F, winds less than 5 miles per hour
July 28, 2004	Sunny, temperatures around 85 °F, winds less than 5 miles per hour

Table 3. Karner blue butterfly observations by ROW.

Survey Location	Survey Date	Karner Blue Butterfly Observations
Aetna ROW A	June 3	None
	July 19	2 males
Aetna ROW B	June 2	None
	July 19	None
	July 28	None
Ogden Dunes	June 3	3 females, 2 males
Miller ROW A	June 3	2 females, 1 male
Miller ROW B	June 3	3 females, 3 males
Miller ROW C	June 3	1 male
Stagecoach Road ROW A	June 2	None
	July 19	2 males
Stagecoach Road ROW B	June 2	None
	July 19	1 male
Stagecoach Road ROW C	June 2	None
	July 19	1 female

IV. Conclusions

Karner blue butterflies and wild lupine were observed within all study areas with the exception of Aetna ROW B. Twenty-two Karner blue butterflies and sixty wild lupine populations totaling 4.24 acres were observed within the site boundaries. Karner blue butterfly nectar species and wild lupine habitat were observed within all study areas. Vegetation communities such as sandy prairies, open oak savannas, and early successional oak and sassafras woods commonly had wild lupine and Karner blue butterfly nectar species growing within them.

Several areas within the ROWs were commonly not wild lupine habitat or habitat for other Karner blue butterfly nectar species. Wetlands were the most common vegetation community where wild lupine and other Karner blue butterfly nectar species were not observed. Areas where trees are growing and creating more shade will eventually not

be wild lupine or other Karner blue butterfly nectar species habitat, as these species prefer more sunlight. Also, areas where undesirable and invasive species are present may eventually not be wild lupine or other Karner blue butterfly nectar species habitat, as the undesirable and invasive species may eventually out-compete the desirable species further limiting habitat for the target species.

In order to improve wild lupine and Karner blue butterfly habitat along the study area, undesirable and invasive species should be controlled. Selective treatment of woody vegetation would also increase the likelihood of wild lupine populations increasing in size and abundance. Wild lupine can be seeded in appropriate habitat to attract Karner blue butterflies to the project site in the future. The data in this report can be used as a baseline for future monitoring efforts.

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[1] Glassberg, Jeffrey. Butterflies Through Binoculars: The East. New York: Oxford University Press, 1999. Page 101-102.

[2] Karner Blue Butterfly. http://www.wbu.com/chipperwoods/photos/karner.htm.

[3] Karner Blue Butterfly Fact Sheet. http://midwest.fws.gov/endangered/insects/kbb/kbb_fact.html.

[4] Karner Blue Butterfly, U.S. Fish & Wildlife Service. http://endangered.fws.gov/i/I0Q.html.

[5] Shull, Ernest M., The Butterflies of Indiana. Indiana Academy of Science, 1987. Page 163-164.

[6] Species Profile for Karner Blue Butterfly. http://ecos.fws.gov/servlet/SpeciesProfile?spcode=100F.

FIGURES

NiSource
2004 Baseline Monitoring Report
Wild Lupine and Karner Blue Butterfly Survey

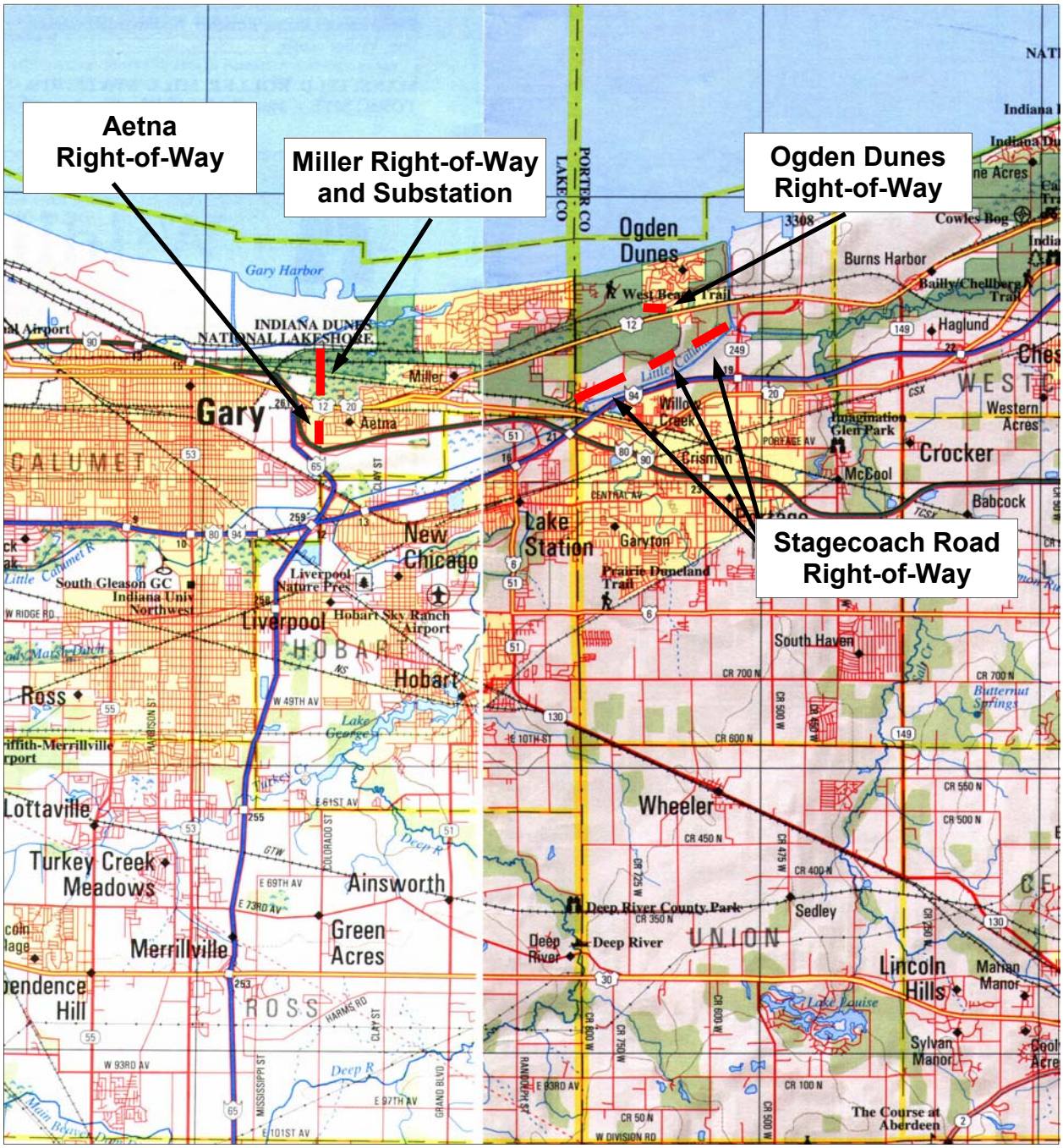

Figure 1: **Location Map**
Wild Lupine/KBB Surveys
NiSource
Lake and Porter Counties, Indiana

N

Scale: 1" = 2.5 mi.

JFNew #02-04-13M2-3

JFNew
708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com

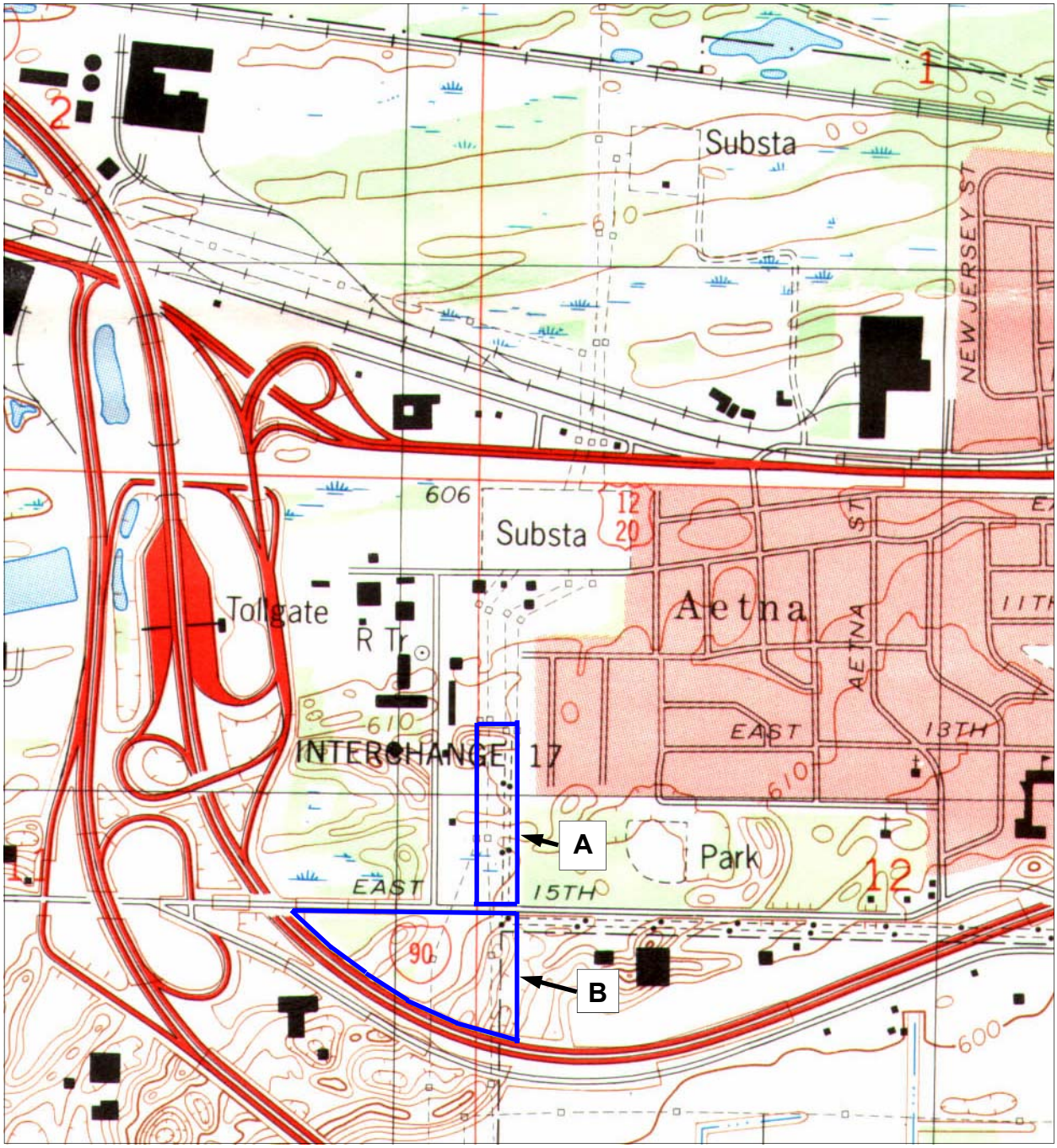

Figure 2: **Aetna Right-of-Way**
Wild Lupine/KBB Surveys
NiSource
Lake and Porter Counties, Indiana

N

Scale: 1" = 1,000'

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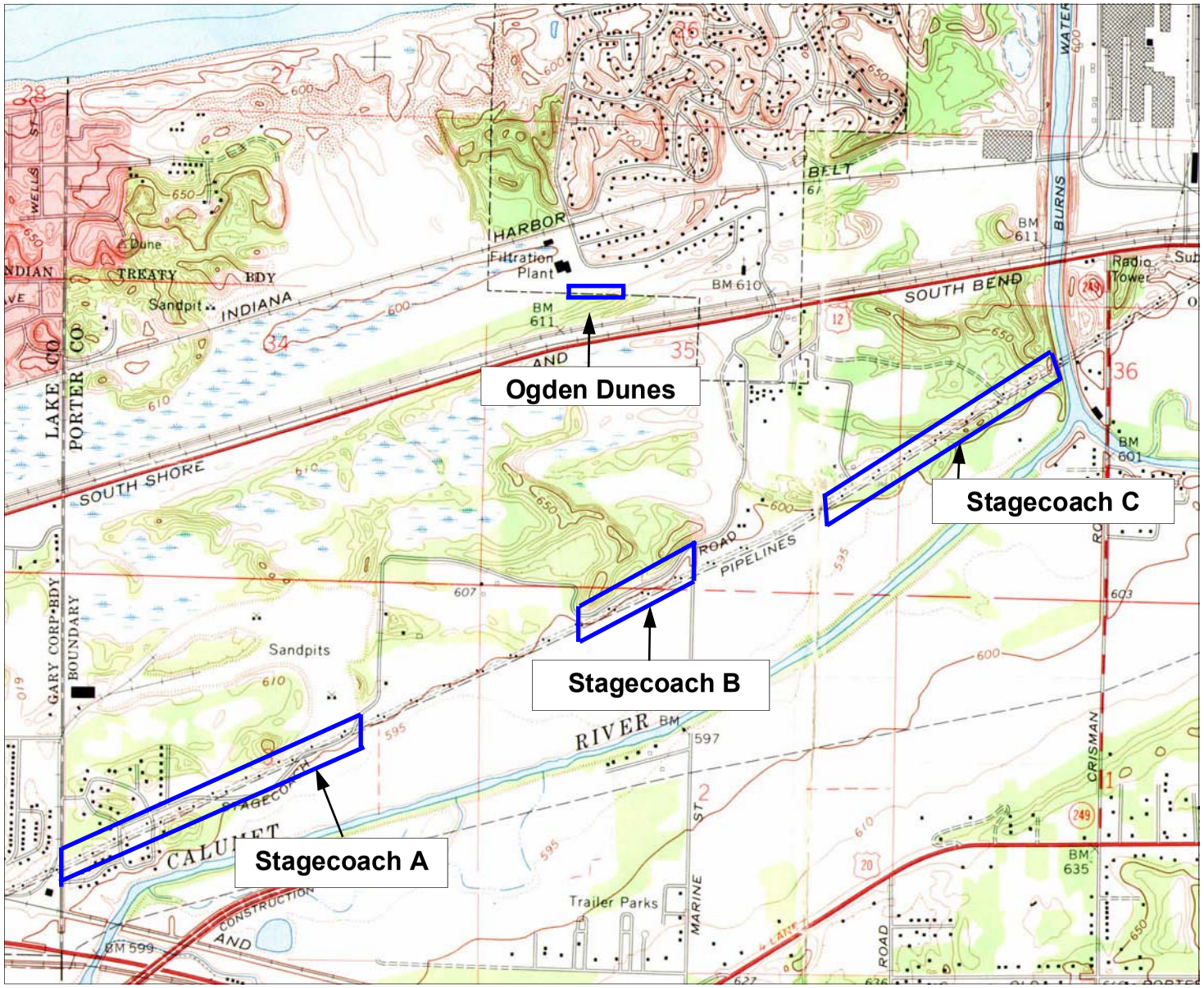

Figure 3: **Stagecoach and Ogden Dunes Right-of-Way**
Wild Lupine/KBB Surveys
NiSource
Lake and Porter Counties, Indiana

N

Scale: 1" = 2,000'

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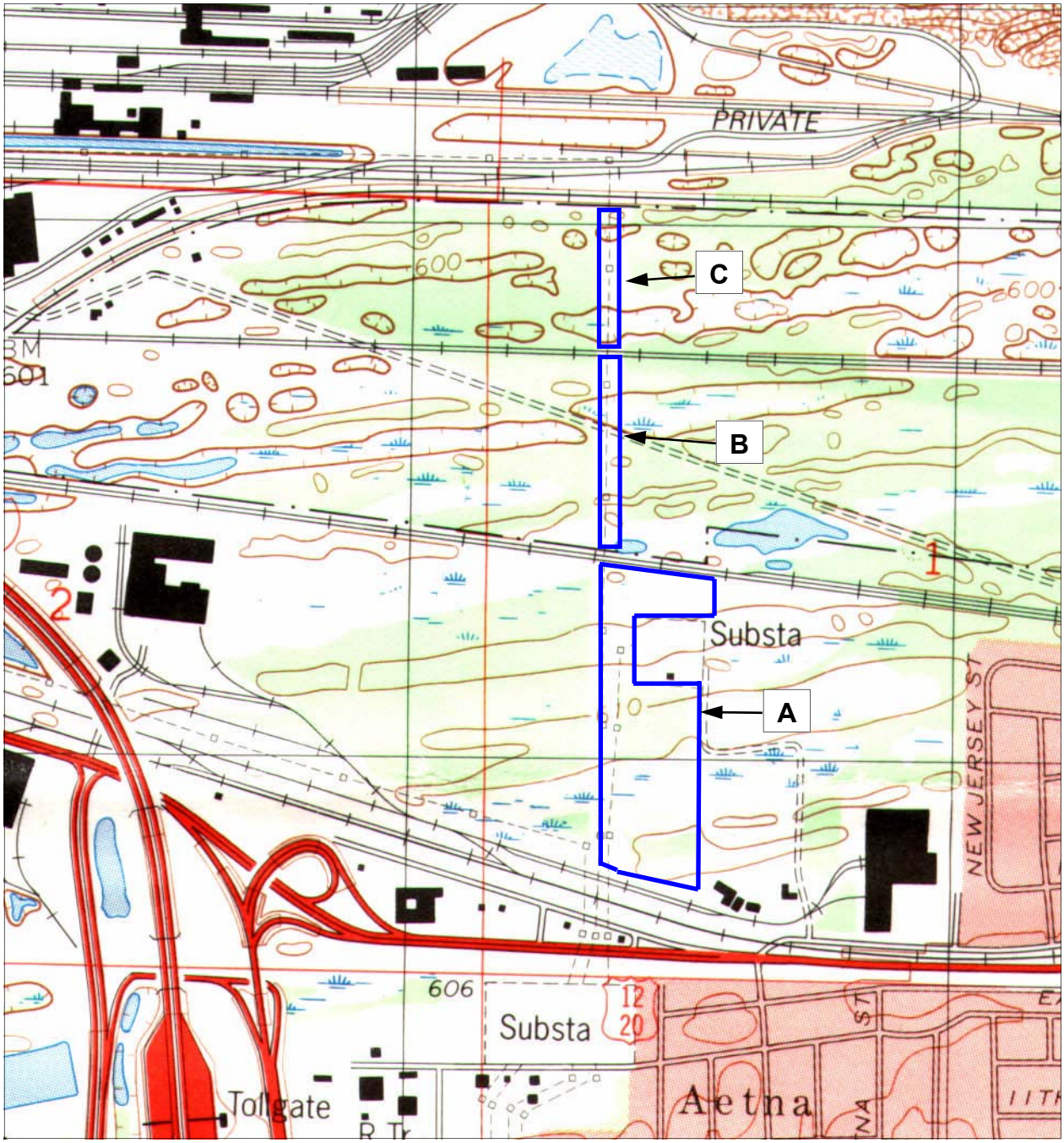

Figure 4: **Miller Right-of-Way**
Wild Lupine/KBB Surveys
NiSource
Lake and Porter Counties, Indiana

N

Scale: 1" = 1,000'

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APPENDIX A – WISCONSIN DNR
KARNER BLUE BUTTERFLY SURVEY PROTOCOL

NiSource
2004 Baseline Monitoring Report
Wild Lupine and Karner Blue Butterfly Survey

Wisconsin Karner Blue Butterfly
Habitat Conservation Plan and Environmental Impact Statement

Appendix G. Effectiveness Monitoring Protocol

This appendix includes a protocol to be used for effectiveness monitoring. The protocol was developed by the HCP partners.

Table of Contents

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A. Introduction

This document describes the plan for statewide effectiveness monitoring of Karner blue butterflies and Karner blue butterfly habitat. The effectiveness monitoring undertaken as a component of the HCP will be conducted on those lands enrolled by HCP partners for management in regards to the butterfly under the agreements set forth through the HCP process. Effectiveness monitoring is a component, along with self monitoring and auditing, of the procedures required to gauge the success of the HCP.

B. The HCP and Adaptive Management

This HCP will apply adaptive management to address conservation within the context of a working landscape. While this adaptive management approach offers HCP partners the flexibility needed to meet their respective goals, effectiveness monitoring is essential to adaptive management, and ultimately to support the need of the Karner blue butterfly for the dynamic landscape necessary to maintain viable populations.

C. Objectives of Effectiveness Monitoring

The purpose of effectiveness monitoring is to provide an economical and biologically sound means of detecting statewide trends in the presence of Karner blue butterfly habitat, the presence of occupied sites, and the relative abundance of Karner blue butterflies through formal and systematic sampling. Trends in these variables profile the overall condition of the species in Wisconsin. This information will be used to assess to efficacy of the HCP and to inform adaptive management decisions.

D. Components of Effectiveness Monitoring

Level I Monitoring. Sampling for Presence of Habitat. For habitat survey, the presence or absence of wild lupine will be determined and its abundance broadly quantified (see Lupine Presence/Absence Monitoring Protocol). This level of effectiveness monitoring applies only to the Shifting Mosaic Management Strategy. Habitat survey, however, will also need to be conducted on new Permanency of Habitat sites and new Shifting Mosaic sites replacing those lost to succession or forestry activities. On sites where the presence of habitat has been established, lupine surveys will need to be repeated after several years in response to habitat changes brought about by forestry activities or natural succession**.**

Level II Monitoring. Sampling for Presence of Butterflies. A sample of sites with lupine present will be chosen for survey to establish presence or absence of Karner blue butterflies.

Level III Monitoring. Relative Abundance Monitoring. A sample of sites will be chosen for counting butterflies observed along transects across the habitat patches on the site to establish a site index of the relative abundance of butterflies present.

Habitat Evaluation. Further habitat evaluation beyond the elements to be recorded on the relative abundance monitoring field form is useful to inform adaptive management decisions. The Bidwell habitat evaluation procedures developed for Karner blue butterfly habitat are not a required component of the effectiveness monitoring program at this time. However, habitat evaluation will be useful to partners in the self monitoring process to assess habitat alterations as a result of management or as a component of research.

E. Site Eligibility

Level I Monitoring

The eligible pool of survey sites for sampling presence of habitat is limited to sites that meet the following three criteria:

1. Is within the *High Potential Range* of the Karner blue butterfly

2. Meets the definition of *potential habitat*, and

3. Is *included by* Shifting Mosaic Strategy partners in the HCP.

"High Potential Range" is the region of the state containing all documented occurrences of the Karner blue butterfly, and extending beyond the documented range to include areas with similar habitat, soils, and climate, where the Karner blue butterfly is most likely to occur.

"Potential Habitat" includes sites on dry, sandy soils with dominant overstory vegetation of an age and/or character that could support Karner blue butterfly habitat.

Level I sites include forest "stands" and upland openings or existing corridors. A site is as large as possible up to approximately 40 acres, considering geographical features, and this at the discretion of the partner. If forested, the site supports trees of 0-15 years of age or if non-forested, the site may be an upland opening or existing corridor such as a fuel break or woods road. If forested and less than 15 years of age, dense stems of a regenerating stand may cause crown closure at an early age precluding the site from consideration for sampling.

Lands Included by Shifting Mosaic partners in the HCP: These are sites defined in partner Conservation Agreements as lands included in the conservation strategies "management for consideration" and/or "management to feature or enhance."

Level II Monitoring

The site pool is formed of those sites in the High Potential Range and included by the partners in the HCP, on which the presence of Karner blue butterfly habitat has been established. Sites are chosen from the pool of sites with lupine from the previous five[A] monitoring seasons. A site includes at least 25 plants or clumps of lupine at a density of 50 plants per acre or 25 plants per 200 m of linear distance. A linear site has no more than 200 m of contiguous non-habitat. ROW sites are limited to 250 m in length. Other sites are limited to a maximum size of approximately 40 acres.

Level III Monitoring

The site pool for Level III Monitoring is the group of sites selected[a] for Level II Monitoring.

F. Sample Size

Analysis of existing Karner blue butterfly monitoring data was conducted to determine the appropriate number of sites to annually monitor in order to detect trends over time. A 10-year monitoring program of 100 to 200 stands monitored each year is likely to detect annual changes of five percent and in some cases two percent in stand occupancy. Annual percentage changes in stand occupancy differ from that of annual percent changes in stand indices; in order for stand occupancy to decrease by one stand, many individuals must have been eliminated.

For purposes of effectiveness monitoring for the HCP, the following numbers of sites will be sampled yearly:

Level I Monitoring: 200 sites

Level II. Monitoring: 200 sites (100 Shifting Mosaic, 100 Permanency of Habitat)

Level III. Monitoring: 80 sites (50 Shifting Mosaic, 30 Permanency of Habitat)

Partners following primarily the Shifting Mosaic management strategy will conduct Level I monitoring on 200 sites to determine the presence or absence of lupine. The group will sample 100 sites on which lupine is present to determine the presence or absence of the Karner blue butterfly. Fifty of those sites will also be marked for collection of Level III relative abundance monitoring data.

Partners following primarily the Permanency of Habitat management strategy will conduct Level II monitoring on 100 lupine sites for Karner blue butterfly presence/absence. Additional sites are added each year to better ensure a full data set. Each partner will monitor a minimum of five sites which will include the partner's own sites that were chosen. The remaining sites will be distributed among the Permanency of Habitat partners by cooperative agreement.

The Permanency of Habitat group has committed to monitoring 30 sites for relative abundance of the butterfly. These 30 sites plus a few additional sites for greater certainty of a full set of data, are nested within the sites chosen for presence/absence monitoring.

G. Stratification of Sample

Selection of sampling sites will be stratified, both for analysis purposes and to distribute survey sites among partners. The purpose of stratification is to reduce the variance in the overall estimate. Stratification by ecoregion will not be used during the initial monitoring period but may be used later as the database from effectiveness monitoring is developed. For any given sample size, it will take a longer period of time to draw statistically valid conclusions by conservation strategy or ecoregion than for the statewide sample. Sampling will be stratified initially by the two management strategies, Shifting Mosaic and Permanency of Habitat.

Within the Shifting Mosaic category, sampling will be further stratified by ownership in proportion to the number of acres included by each partner in the HCP under the categories of "management with consideration" or "management to feature, protect, and enhance." Stratification by ownership in this case, may present a site distribution more representative of habitat across the Wisconsin range of the Karner blue butterfly than would strictly random sampling, given the wide range of variability in acreage included in the HCP, site size, and geographic presence of the individual partners' lands. Permanency of Habitat sample sites will be randomly selected across the partnership lands involved.

H. Site Selection Procedures

The DNR will maintain the database from which the Shifting Mosaic group sites will be chosen. All eligible sites according to the above criteria will be submitted to the DNR and entered into the database from which the required number of sites will be chosen for each partner to monitor according to a random selection process from within each partner's pool of sites.

The DNR will also maintain the database from which the Permanency of Habitat group sites will be chosen. All eligible sites will be sent to the DNR and combined in a single pool from which the requisite number of sites will be randomly chosen. Partners will be sent up to five of their own sites that were chosen. The remaining sites will be distributed with consideration including but not exclusive of the following criteria: ownership, geographical location, type of site, site size.

I. Monitoring Protocol

1. Level I. Lupine Presence/Absence Monitoring

The following protocol is taken from Appendix II of the Wildlife Management Guidelines for the Karner Blue Butterfly developed by the Wisconsin DNR Karner Blue Butterfly Technical Team, as revised with information from the Biological Subteam of the Statewide HCP (May, 1998 Revision). The protocol was developed by the HCP Monitoring Subteam in 1993.

Purpose: To find/map wild lupine (*Lupinus perennis*) patches to expedite future Karner blue butterfly (*Lycaeides melissa samuelis*) surveys.

When To Survey:

- In places where lupine flowers early (sunny areas), survey from late May to mid-June. In places where lupine flowers rarely or not at all (usually more shaded areas), surveys can be conducted from late May through July.

- Open and sunny places should be surveyed earlier in the season because lupine flowers and senesces earlier there.

- Areas with more shading and canopy cover can be surveyed later because lupine flowers and senesces later in these locations (except during hot and droughty summers).

- Lupine surveys should not be conducted after July 31.

How To Survey: An individual who is knowledgeable in the identification of lupine should conduct the surveys (lupine photos can be obtained from the DNR Bureau of Endangered Resources). Surveys for lupine can be conducted in numerous ways. The following are suggested methods to use. The method chosen will normally depend upon the amount of resources available (number of personnel) and the amount of area to be surveyed.

OPTION 1: Surveyors walk a site spaced so all areas between surveyors can be seen by at least one surveyor. Thus, each surveyor walks a "strip transect" because a strip or corridor of habitat is being surveyed. The distance between surveyors will depend upon visibility of lupine (flowering or not), density of vegetation, and the slope of the site.

OPTION 2: Surveyors walk a site spaced a pre-determined distance apart (i.e. 50 feet, 100 feet, etc.). Each surveyor will be conducting a strip transect. Depending upon the distance between surveyors and density of vegetation, not all areas will be observed by a surveyor

(a percentage of a site will be surveyed). The distance between surveyors will depend upon the amount of area to be surveyed in the time available.

OPTION 3: Random Walk Survey for a specified time (5 minutes) that produces a description of what was found and an estimated % coverage of habitat by the survey.

Mapping Lupine Patches: Boundaries of lupine patches should be mapped as accurately as possible. This will assist in conducting future Karner blue butterfly surveys.

When mapping lupine, it may be useful to characterize each site by relative abundance and pattern of lupine distribution. Options for accomplishing these are listed below but are not mandatory:

OPTION A:
- Relative Abundance (estimate)
  - A (Abundant): the dominant ground layer vegetation
  - LA (Locally Abundant): abundant in patches
  - C (Common): frequently encountered
  - O (Occasional): infrequently encountered
  - R (Rare): very few plants seen

OPTION B:
- Estimated No. of Lupine Plants or Clumps
  - 10's
  - 100's
  - 1,000's
  - 10,000+

OPTION C:
- Pattern of Lupine Distribution
  - Continuum from 1-4:

1	4
scattered patches	uniform throughout

An estimate on the area of lupine coverage should be made. It is important to know if there are 10,000+ lupine plants in a one acre area versus a 10 acre area.

Low Potential Survey Areas: Since it will be impossible for most partners to survey all land holdings, the following list of low potential survey areas is provided:

- wetlands, or areas flooded for most of the growing season

*- forests with dense canopy (>75%), which could be determined by aerial photo interpretation of forest stands with a continuous canopy >75%, categorized as pole or saw timber sized stands having 3-prime density class

- sites on non-sandy soils

- cultivated or otherwise developed areas supporting no native vegetation

* NOTE: Lupine may occur in forests with greater than 75% canopy especially when the forest is adjacent to a lupine patch. Lupine may not flower in such areas and thus may be difficult to detect.

Auditing: Recommend written documentation by the surveyor on who did what, when, and where. This is important since various survey methods will be used. This requires either a standardized form or standardized requirements for what information must be reported.

2. Level II. Butterfly Presence/Absence Monitoring

The following protocol is taken from Appendix III of the Wildlife Management Guidelines for the Karner Blue Butterfly developed by the Wisconsin DNR Karner Blue Butterfly Technical Team as revised with information from the Biological Subteam of the Wisconsin Statewide HCP (May, 1998 Revision and January, 1999 Revision). The protocol was originally developed by the HCP Monitoring Subteam for the 1995 field season.

Purpose: To determine if Karner blue butterflies occupy a particular habitat area (lupine and surrounding nectar species). The following are s*uggested minimum requirements* for conducting Karner blue butterfly (*Lycaeides melissa samuelis*) presence and/or absence surveys. For the purpose of this survey, "absence" means that Karner blue butterflies were not detected at a particular site. It is not a 100% guarantee that Karner blue butterflies do not exist at the site.

When To Survey:

- Surveys for the Karner blue butterfly can be conducted during both the first or second flight periods. The first flight normally begins in late May and ends in mid- to late June, while the second flight normally begins in mid-July and ends in mid- to late August.

- Timing of flight periods can vary by as much as 2-3 weeks from year-to-year and/or from site-to-site.

- The length of flight periods may also vary from year-to-year (2-5 weeks in length).

- If resources do not allow you to conduct surveys during both flights, priority should be placed on conducting surveys during the main second flight (see "Determination of No Karner blue butterflies" listed below).

- Only one survey is needed if Karner blue butterflies are detected during the first survey. If you do not detect Karner blue butterflies during the first survey, a second survey should be conducted. If Karner blue butterflies are not detected during the second survey, a third survey should be conducted. One of these surveys may be conducted during the first flight period. Surveys during second flight should be spaced so that there is a 3-7 day interval between them.

- Conduct surveys during optimal time and weather conditions as listed below:
    - between 8:00 a.m. and 6:00 p.m.
    - when temperatures are above 60^0 F
    - when temperatures are between 60^0 F and 70^0 F surveys should only be conducted under mostly sunny skies with calm to light wind
    - when temperatures are above 70^0 F, no restrictions on cloud cover
    - when winds are less than 20 mph
    - do not survey under drizzly or rainy conditions

How To Survey: An individual who is knowledgeable in the identification of Karner blue butterflies should conduct the surveys. It is recommended that individuals conducting surveys obtain training in identifying Karner blue butterflies offered by DNR Karner blue butterfly biologists. An alternative to this is having DNR or USFWS staff positively identify a voucher photograph. Photograph must capture underside of wing for positive identification. Identification photos of Karner blue butterflies may be obtained from the Bureau of Endangered Resources.

- The Karner blue butterfly habitat area (lupine and associated nectar species) should be identified ahead of time when possible.

- If a site is chosen for Level II Monitoring only, the surveyor(s) should walk the entire habitat area at a leisurely pace until all likely locations of Karner blue butterfly concentration areas are surveyed OR surveyors may cover the area by walking transects to look for the butterflies. The purpose of the survey is fulfilled when one Karner blue butterfly is observed (during either the first or second flight period).

- If a site is chosen for both Level II and Level III Monitoring, surveyors may conduct one of the three required Level II surveys during first flight, as above. Second flight surveys should follow the protocol for Level III monitoring. Once the first Karner blue butterfly is encountered during a second flight survey, proceed to count butterflies along the

transects, i.e., Level III Monitoring has begun.

- Karner blue butterflies observed outside the site boundary that can be positively identified as Karner blue butterflies from within the site can be counted for that site.

Intensity Of Survey:

- Approximately 10 minutes of effort per survey are recommended for each acre of habitat (i.e. lupine patches and important nectar flowers within 50 meters of the lupine patch) to determine presence/absence. If a Karner blue butterfly is quickly spotted, it is not necessary to spend 10 minutes per acre of habitat. Surveying for a longer period of time is encouraged (but not mandatory) if Karner blue butterflies are not found during the first 10 minutes of survey effort per acre of habitat.

Determination Of No Karner Blue Butterflies:

- The determination that no Karner blue butterflies are present at a site can be made once the site has been surveyed (without documenting any Karner blue butterflies) three times during one year. One of these surveys may have been made during the first flight period. Surveys should be spaced so that there is a 3-7 day interval between surveys. Once one Karner blue butterfly is observed the purpose of the survey is fulfilled and additional surveys are not required.

General Information:

- The "Determination of No Karner blue butterflies" is based primarily on surveys during the second flight since Karner blue butterfly numbers are usually greater during this flight period.

- Karner blue butterfly flight periods vary within the year from site-to-site depending on the site's phenology (i.e. "fast" sites and "slow" sites). Flight periods normally occur first on sunny open sites and later on shady sites. Spacing of the surveys is necessary to ensure that at least one survey is conducted during the peak of the main flight. A 3-7 day range is used because the duration and amount of suitable survey weather varies among years.

- The Karner blue butterfly hotline has been initiated to inform surveyors across the range of the butterfly in Wisconsin of the status of the flight period in different geographic areas. Variations between sites within an area however, must be considered by the land managers familiar with the sites to decide which may be “fast” or “slow” and plan survey work accordingly.

- Auditing: Recommend written documentation by the surveyor on who did what, when, and where, and under what field conditions (weather, lupine condition). This will require either a standardized form or standardized requirements for what information must be reported. Recommend also that the HCP Team provide written documentation of the annual Karner blue butterfly phenology.

- Time Period of Effectiveness of Results: The presence/absence survey has both a spatial and temporal component (i.e. absent here now but present here later). The question - How long does the absent status apply? - will need to be addressed.

3. Level III. Karner Blue Butterfly Relative Abundance Monitoring

The following protocol was developed by the HCP Monitoring Subcommittee April 3, 1998 and revised January, 1999.

Definition: This type of monitoring will result in a yearly relative abundance index for Karner blue butterflies across the Wisconsin range. Relative abundance is a term often used to mean the number of individuals of one species relative to the number of individuals of all species present. The term "relative abundance index" is defined here as a number or index of Karner blue butterflies relative to the total abundance of Karner blue butterflies present. The statewide index is a combination of the relative abundance indices from all sites sampled. These indices are not comparable between sites and should not be used to assess Karner blue butterfly relative abundance or habitat quality between one site and another.

Relative Abundance Index Measure:

The site index is measured by counting the number of butterflies observed per meter of transect covered. All butterflies identified as Karner blues, no matter what distance from the transect, will be recorded. Karner blue butterflies outside the site boundary that can be positively identified from within the site will be counted. The site index is the sum of the two counts from the two required visits.

Site Visits and Peak Flight Period:

Visit a site two times to count Karner blue butterflies during the peak second flight period with 7 or more days between visits. The DNR will maintain a regularly-updated Karner blue butterfly flight period hotline for the dissemination of information on the flight periods in the state. Calling this hotline at least every two days after the flight period begins will assure the best opportunity to be informed on the progress of the flight. The date of peak flight is estimated by observation of Karner blue butterfly numbers and the ratio of males to females observed as the flight period proceeds. Optimum timing of the two visits would occur within a period extending 4-5 days before and after the date of peak flight.

Karner Blue Butterfly Habitat Defined:

Karner blue butterfly habitat is defined as those areas likely to support Karner blue butterflies and consisting of areas of lupine and associated patches of nectar plants within 50 meters of lupine.

Site Reconnaissance:

Map habitat elements (lupine/nectar concentrations and corresponding Karner blue butterfly concentration areas) and habitat subunits (areas of varied management, ROW opening to forest edge, open prairie to semi-open savanna or barrens). Determine boundaries of subunits and site. In some cases, flagging of habitat elements is recommended early in the season to better locate lupine or feeding areas during second flight. Note: second flight nectar sources may not have been noticeable early in the season but sunny openings, road or trail edges, log piling areas, nearby old field habitats, etc. may give clues to the location of a diversity of flowering plants and thus butterflies feeding during second flight.

Weather Conditions:

Conduct surveys on warm, sunny days when butterflies are active. Avoid surveying when the following conditions are present *on site*: cloudy days with temperatures below 65^{o} F, mid-day hours on very hot days**,** i.e. above 85^{o} F. (butterflies may be so active that identification is difficult or butterflies may be very inactive), damp early mornings, days of drizzle or rain, windy days, i.e. above 18 mph. Plan ahead to take advantage of optimum weather conditions when they appear during the peak flight period to avoid resorting to surveys under poor conditions for the second counts.

Transect Method:

Straight line transects will be used running parallel across the entire Karner blue butterfly habitat of the site. A site may include more than one habitat patch which may best be addressed with separate sets of parallel transects.

Transect Placement:

Transects are placed across all cover types (shrubby, open grassy, wooded, road or trailside, etc.) within the Karner blue butterfly *habitat* on the site. Parallel transects are placed to allow an equal opportunity to observe butterflies on all portions of the habitat, in spite of any subjective determination of the observer as to "good" habitat. Parallel transects should be established across the habitat on the site until the entire habitat (or complex of habitat patches) is covered.

Weather conditions vary considerably between sites and at different times of day. Transect direction relative to the sun affecting the ability of the observer to see Karner blue butterflies and transect direction relative to the wind affecting Karner blue butterfly behavior are elements that should be considered when placing transects on the day of the count on sites where variation in direction of transects is an option (ROW transect placement in most cases must parallel the right-of-way). Other site conditions to be considered are site size, topography, and the presence of dense shrubs, surface waters, or other elements creating walking hazards on the site. The first transect at a habitat patch on the site is chosen by walking a random number of paces from the corner of the habitat patch within 20 meters of the corner and establishing the end of the transect.

Transect Spacing:

Transect spacing of 20 meters at each site will allow for a consistent index per site in spite of habitat differences. This distance is great enough to expect that all butterflies observed along one transect will not be observed along the next (butterfly movement being an uncontrollable variable) and is beyond the effective distance for identification and count of butterflies (usually assumed to be 6-8 feet).

Transect Distance:

The total transect distance will vary according to the size of the site. Larger sites will require more and/or longer transects in order to cover the entire habitat on the site. Transect spacing will remain the same.

Number of Counters at a Site:

In order to minimize double counting, flushing butterflies, and other complications introduced by multiple observers, the number of persons counting Karner blue butterflies along one transect is limited to one. A recorder may follow the person counting butterflies. Multiple counters are acceptable walking separate transects on the same site.

Certification of Butterfly Counters:

All persons collecting field data for relative abundance monitoring must have attended a training session to be conducted by certified trainers versed in monitoring protocols and experienced with Karner blue butterfly biology, behavior, and habitat requirements. One or more training sessions will be offered during the first flight period (late May-early June) each year as need dictates. The training will cover protocol procedures, Karner blue butterfly identification, issues of variability in habitat, habitat elements, Karner blue butterfly behavior, etc. It is mandatory for previously certified field personnel to undergo refresher training at least once every five years.[B] Certified trainers will be available in each of three geographic areas of the range.

Relative Abundance Monitoring Report Form:

The following information is requested of partners to be reported on the report form:

- Date, Time Began, Time Finished, Total Time Spent Counting, %Time Sun Shining.

- Air Temperature, Wind Speed, %Cloud Cover at beginning and end of counting period.

- Site Name/Site Code; Partner/Landowner Name; Observer Name; County, T/R/S, Location; Management Strategy for the Site; Site Size: Acreage or Linear Dimension, Number of Habitat Patches, Total Transect Length; Number of Butterflies Counted: males, females, (gender opt.), unknown; Second Flight Nectar Available: Type and General Abundance Estimate.

[a] Clarification A
[A] Amendment A
[B] Amendment B

APPENDIX B – WILD LUPINE POPULATION MAPS

NiSource
2004 Baseline Monitoring Report
Wild Lupine and Karner Blue Butterfly Survey

Sheet 1: **Wild Lupine Survey Results**
Aetna A Right-of-Way
NiSource
Lake and Porter Counties, Indiana

N

Scale: 1" = 200'

JFNew #02-04-13M2-3

JFNew
708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com

Sheet 2: **Wild Lupine Survey Results**
Aetna B Right-of-Way
NiSource
Lake and Porter Counties, Indiana

N

Scale: 1" = 200'

JFNew #02-04-13M2-3

JFNew
708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com

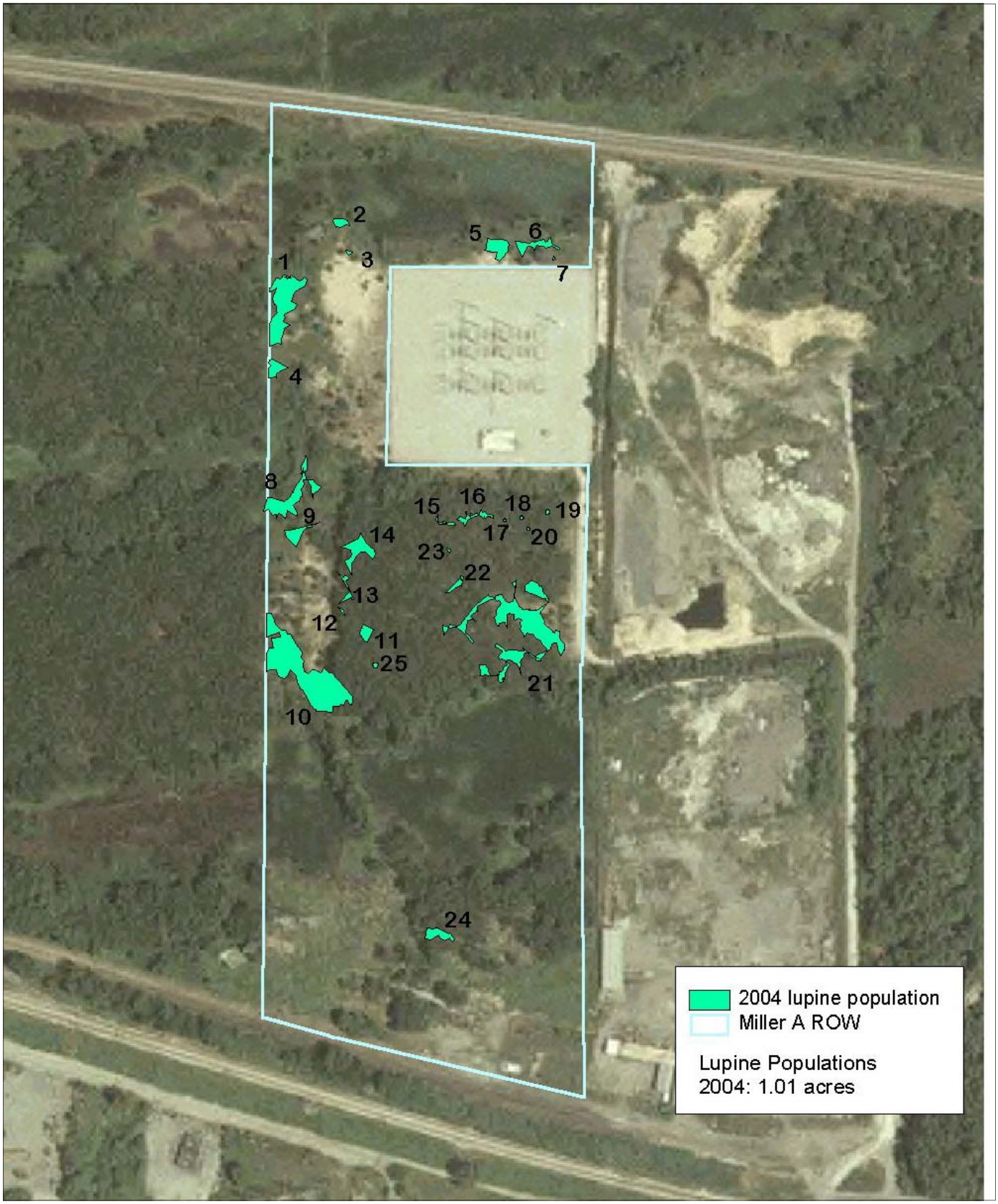
Sheet 3: **Wild Lupine Survey Results**
Ogden Dunes Right-of-Way
NiSource
Lake and Porter Counties, Indiana

N

Scale: 1" = 200'

JFNew #02-04-13M2-3

JFNew
708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com



Sheet 4: **Wild Lupine Survey Results**
Miller A Right-of-Way
NiSource
Lake and Porter Counties, Indiana

N

Scale: 1" = 300'

JFNew #02-04-13M2-3

JFNew
708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com

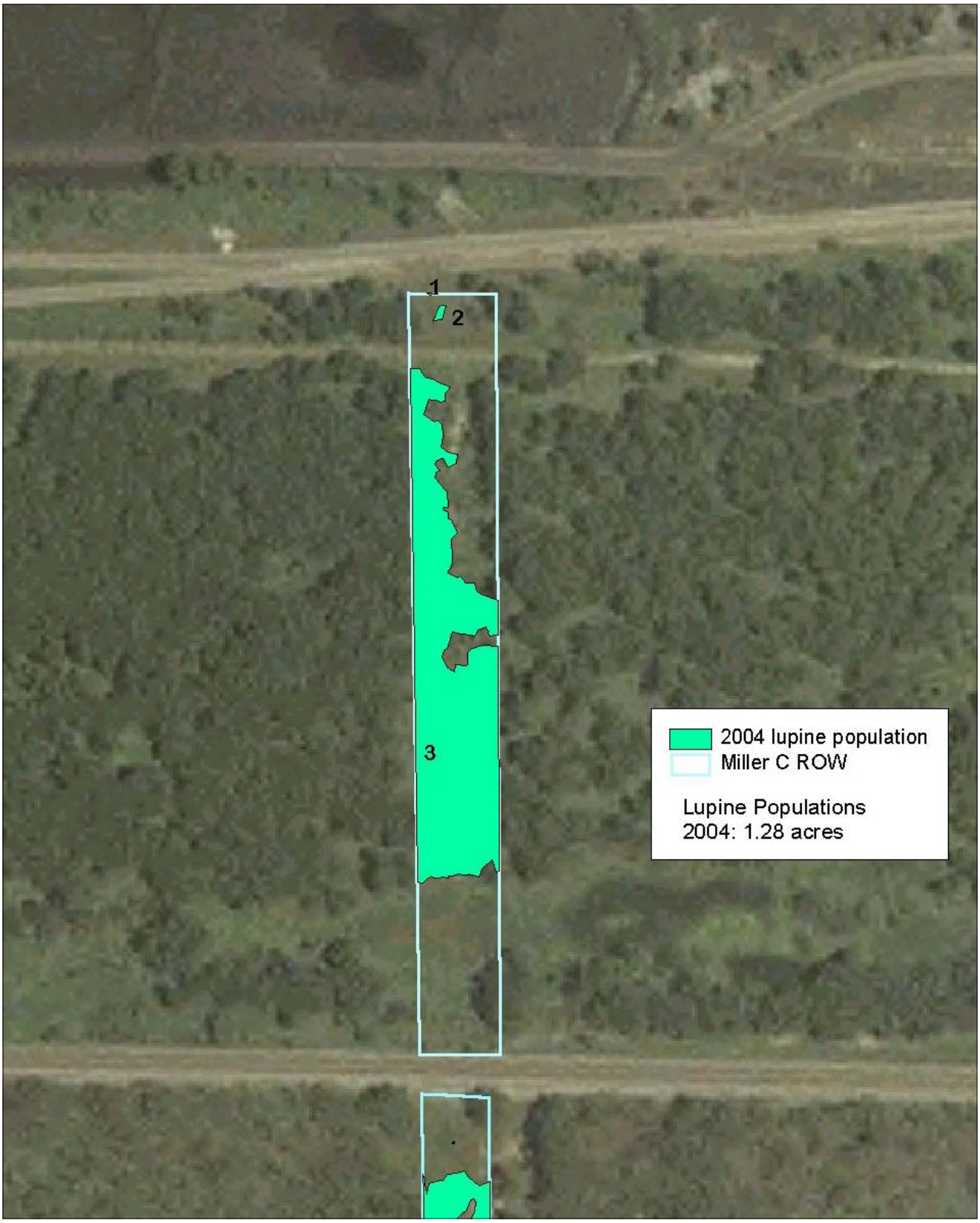
Sheet 5: **Wild Lupine Survey Results**
Miller B Right-of-Way
NiSource
Lake and Porter Counties, Indiana

N

Scale: 1" = 200'

JFNew #02-04-13M2-3

JFNew
708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com



Sheet 6: **Wild Lupine Survey Results**
Miller C Right-of-Way
NiSource
Lake and Porter Counties, Indiana

N

Scale: 1" = 200'

JFNew #02-04-13M2-3

JFNew
708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com

Sheet 7: **Wild Lupine Survey Results**
Stagecoach A Right-of-Way
NiSource
Lake and Porter Counties, Indiana

N

Scale: 1" = 400'

JFNew #02-04-13M2-3

JFNew
708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com

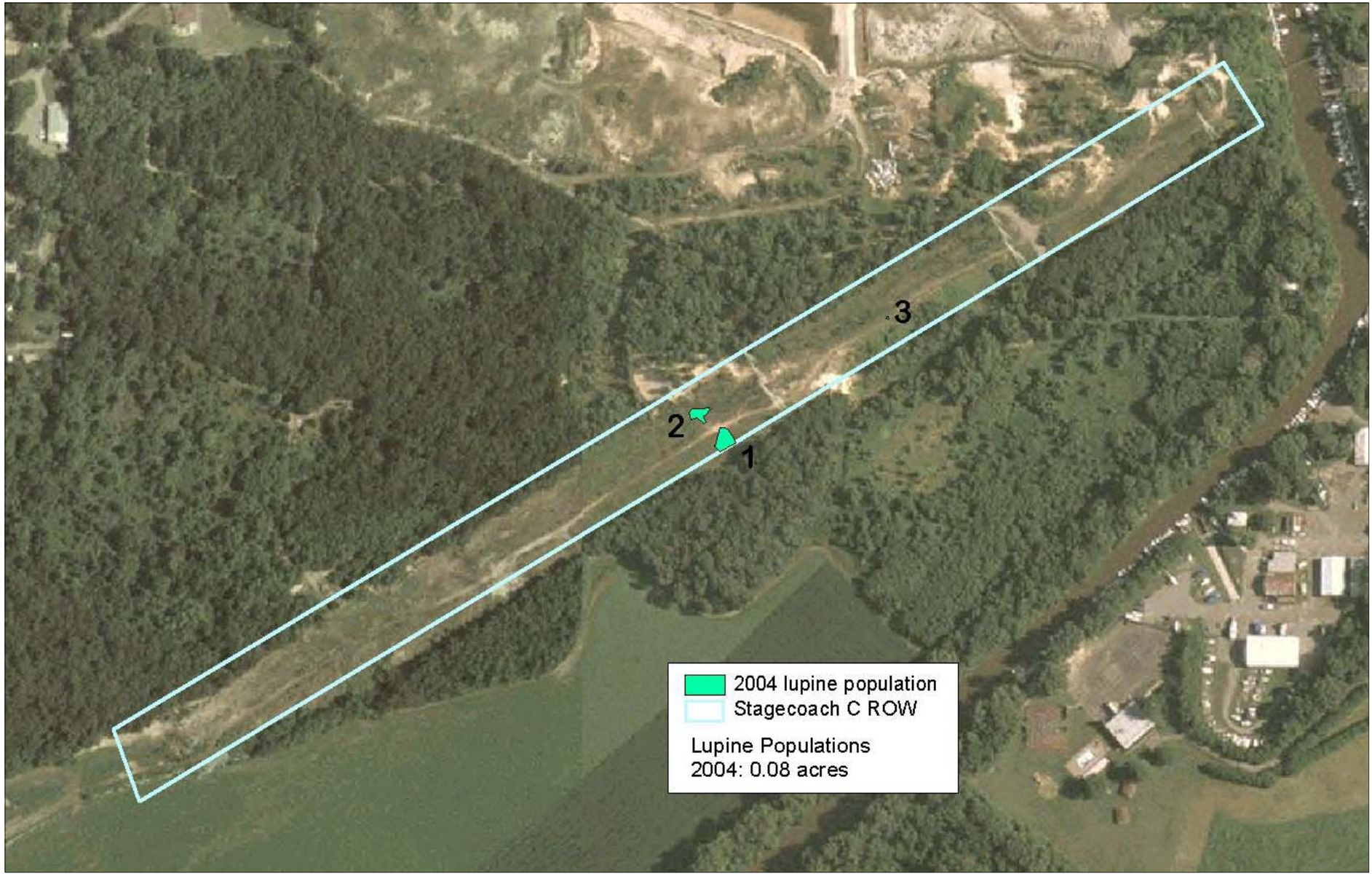
Sheet 8: **Wild Lupine Survey Results**
Stagecoach B Right-of-Way
NiSource
Lake and Porter Counties, Indiana

N

Scale: 1" = 200'

JFNew #02-04-13M2-3

JFNew
708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com



Sheet 9: **Wild Lupine Survey Results**
Stagecoach C Right-of-Way
NiSource
Lake and Porter Counties, Indiana

N

Scale: 1" = 400'

JFNew #02-04-13M2-3

JFNew
708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com

APPENDIX C – WILD LUPINE POPULATION NOTES

NiSource
2004 Baseline Monitoring Report
Wild Lupine and Karner Blue Butterfly Survey

Aetna Right-of-Way A

Eight populations of wild lupine observed.

Nectar species on site: dogbane, sand cress, butterfly weed, sand coreopsis, tall coreopsis, flowering spurge, western sunflower, rough blazing star, hairy puccoon, white sweet clover, horse mint, blackberry/dewberry/raspberry, black-eyed Susan, showy goldenrod

Invasive species on site: quack grass, Japanese chess, downy brome, Canada thistle, horseweed, tall fescue, Morrow's honeysuckle, Kentucky blue grass, quaking aspen, glossy buckthorn

Population	Wild Lupine Notes
1	Fairly dense, especially at north end. None flowering, some fruiting, some vegetative. Riverbank grape at top of slope shading out lupine. *Nectar species:* None *Invasive species:* Morrow's honeysuckle
2	Dense at north and south ends of population, less dense and scattered in middle of population. Some flowering, some fruiting, mostly vegetative. *Nectar species:* butterfly weed, flowering spurge, hairy puccoon, horse mint, blackberry/dewberry/raspberry *Invasive species:* Japanese chess, horseweed, Morrow's honeysuckle, Kentucky blue grass, quaking aspen to west
3	One plant. Vegetative. *Nectar species:* None *Invasive species:* quack grass, Kentucky blue grass dominant in vicinity
4	Fairly dense at north end, scattered and sparse at south end. None flowering, some fruiting, some vegetative. Lots of riverbank grape crowding out wild lupine. *Nectar species:* horse mint, blackberry/dewberry/raspberry *Invasive species:* quack grass, downy brome, Morrow's honeysuckle
5	Dense in center and west, sparse at east end of population. Few flowering, mostly fruiting. *Nectar species*: blackberry/dewberry/raspberry *Invasive species*: quack grass
6	Small population, but fairly dense within population. Most have fruited. *Nectar species*: blackberry/dewberry/raspberry *Invasive species:* quack grass
7	Dense at north and east ends, scattered throughout the rest of the population. One flowering, most fruiting. *Nectar species:* sand coreopsis, tall coreopsis, flowering spurge, western sunflower, rough blazing star, hairy puccoon, blackberry/dewberry/raspberry, black-eyed Susan, showy goldenrod *Invasive species:* Morrow's honeysuckle
8	Scattered throughout population, some large clumps. Mostly fruiting, some have flower buds. *Nectar species:* sand cress, butterfly weed, flowering spurge, hairy puccoon, horse mint, blackberry/dewberry/raspberry, showy goldenrod *Invasive species:* downy brome, Morrow's honeysuckle, Kentucky blue grass, glossy buckthorn

Aetna Right-of-Way B

No wild lupine observed. Lupine habitat is present throughout the site, but no lupine is present.

Nectar species on site: dogbane, sand cress, butterfly weed, flowering spurge, hairy puccoon, white sweet clover, horse mint, blackberry/dewberry/raspberry

Invasive species on site: quack grass, Hungarian brome, downy brome, hardy catalpa, orange day lily, Morrow's honeysuckle, white sweet clover, common reed, Canada blue grass, glossy buckthorn, bouncing bet, Siberian elm

Ogden Dunes Right-of-Way

Three populations of wild lupine observed.

Nectar species on site: sand cress, butterfly weed, whorled milkweed, prairie coreopsis, flowering spurge, rough blazing star, hairy puccoon, white sweet clover, horse mint, common cinquefoil, blackberry/dewberry/raspberry, black-eyed Susan, showy goldenrod

Invasive species on site: downy brome, ground ivy, Morrow's honeysuckle, Kentucky blue grass, black locust, multiflora rose, bouncing bet

Population	Wild Lupine Notes
1	Fairly dense throughout most of population. Strip at east end in middle has no lupine, lupine sparse at west end. A few young black oaks within population that could potentially shade out lupine over time. *Nectar species:* butterfly weed, prairie coreopsis, flowering spurge, hairy puccoon, horse mint, blackberry/dewberry/raspberry, showy goldenrod *Invasive species*: None
2	Dense throughout majority of population. Sparse at very east end. Some fruiting, some vegetative. *Nectar species:* butterfly weed, rough blazing star, hairy puccoon, horse mint, showy goldenrod *Invasive species:* Kentucky blue grass
3	Sparse on portions of slope along south boundary. Scattered and sparse along west end, dense throughout remainder. Most have fruited, some vegetative. *Nectar species:* sand cress, butterfly weed, prairie coreopsis, flowering spurge, hairy puccoon, white sweet clover, horse mint, common cinquefoil, black-eyed Susan, showy goldenrod *Invasive species:* Kentucky blue grass

Miller Right-of-Way A and Savanna

Twenty-five populations of wild lupine observed.

Nectar species on site: spreading dogbane, dogbane, sand cress, butterfly weed, whorled milkweed, New Jersey tea, sand coreopsis, tall coreopsis, flowering spurge, rough blazing star, hairy puccoon, sweet clover, horse mint, common cinquefoil, blackberry/dewberry/raspberry, black-eyed Susan, showy goldenrod

Invasive species on site: quack grass, tree-of-heaven, Japanese chess, downy brome, oriental bittersweet, Canada thistle, Morrow's honeysuckle, Tartarian honeysuckle, wild four o'clock, Canada blue grass, Kentucky blue grass, glossy buckthorn, black locust, bouncing bet

Population	Wild Lupine Notes
1	Large population, dense throughout. Most have fruited, some vegetative. Dwarf honeysuckle and winged sumac shading out wild lupine at north end. *Nectar species:* sand cress, butterfly weed, New Jersey tea, sand coreopsis, flowering spurge, hairy puccoon, horse mint, showy goldenrod *Invasive species:* Morrow's honeysuckle, Canada blue grass
2	Somewhat dense at north end, sparse patches throughout rest of population. All vegetative. *Nectar species:* New Jersey tea, tall coreopsis, blackberry/dewberry/raspberry, black-eyed Susan *Invasive species:* oriental bittersweet
3	Dense around perimeter of population, none in middle where 20-foot tall black oak are present. Some has fruited, most vegetative. Black oak and riverbank grape are limiting population. *Nectar species:* blackberry/dewberry/raspberry *Invasive species:* wild four o'clock
4	Dense throughout the population. Most have fruited, some vegetative. *Nectar species:* spreading dogbane, flowering spurge, blackberry/dewberry/raspberry *Invasive species:* Kentucky blue grass
5	A few small clumps in the population. All vegetative. *Nectar species:* New Jersey tea, flowering spurge, showy goldenrod, black-eyed Susan *Invasive species:* Morrow's honeysuckle nearby
6	Several large dense clumps, a few small clumps and sparse patches scattered within the population. Some have fruited, some vegetative. Morrow's honeysuckle and lots of bracken fern may be shading out lupine. *Nectar species*: sand cress, butterfly weed, New Jersey tea, sand coreopsis, tall coreopsis, flowering spurge, blackberry/dewberry/raspberry, black-eyed Susan, showy goldenrod *Invasive species:* Morrow's honeysuckle, Kentucky blue grass, black locust
7	Small, dense population. All vegetative. *Nectar species:* None *Invasive species:* Kentucky blue grass
8	Somewhat dense in spots, more dense to west side. Could be shaded out by 20-foot tall black oaks and sassafras. *Nectar species:* spreading dogbane, sand cress, butterfly weed, sand coreopsis, tall coreopsis, flowering spurge, horse mint *Invasive species:* Morrow's honeysuckle, glossy buckthorn

Miller Right-of-Way A and Savanna (Continued)

9	Some dense clumps at south end, sparse in area shaded by Morrow's honeysuckle and 20-foot tall black oak. Some has fruited, most vegetative. *Nectar species:* None *Invasive species:* quack grass, Morrow's honeysuckle, Kentucky blue grass
10	Quite dense at south and west ends, less dense to north; extends across right-of-way. Some fruiting, mostly vegetative. *Nectar species:* butterfly weed, whorled milkweed, sand coreopsis, flowering spurge, hairy puccoon, horse mint, black-eyed Susan *Invasive species:* Morrow's honeysuckle, Kentucky blue grass
11	Several scattered, somewhat dense clumps, a few smaller patches. One flowering, the rest vegetative. *Nectar species:* flowering spurge *Invasive species:* Morrow's honeysuckle, Kentucky blue grass
12	Several small scattered clumps. All vegetative. *Nectar species:* sand cress, flowering spurge *Invasive species:* Morrow's honeysuckle, Canada blue grass, Kentucky blue grass
13	Scattered patches throughout the population. All vegetative. *Nectar species:* spreading dogbane, butterfly weed, whorled milkweed, sand coreopsis, flowering spurge, rough blazing star, hairy puccoon *Invasive species:* Morrow's honeysuckle, Kentucky blue grass
14	Separated plants and scattered clumps in the population. All vegetative. *Nectar species:* flowering spurge, showy goldenrod *Invasive species:* Tartarian honeysuckle, Canada blue grass, Kentucky blue grass
15	Several small scattered clumps. All vegetative. *Nectar species:* hairy puccoon, flowering spurge *Invasive species:* Morrow's honeysuckle, Kentucky blue grass
16	Small, scattered, very sparse population. All vegetative. *Nectar species:* flowering spurge, hairy puccoon, showy goldenrod *Invasive species:* Morrow's honeysuckle, Kentucky blue grass
17	One small young plant. Vegetative. *Nectar species:* None *Invasive species:* None
18	One small young plant. Vegetative. *Nectar species:* None *Invasive species:* None
19	One large plant. Vegetative. *Nectar species:* None *Invasive species:* Morrow's honeysuckle
20	One small young plant. Vegetative. *Nectar species:* None *Invasive species:* None
21	A few large patches toward south end, large patch at northeast end, small clumps and scattered individuals throughout. None flowering, some fruiting, most vegetative. *Nectar species:* sand cress, butterfly weed, sand coreopsis, flowering spurge, hairy puccoon, horse mint, sweet clover, blackberry/dewberry/raspberry, showy goldenrod *Invasive species:* Morrow's honeysuckle, Kentucky blue grass

Miller Right-of-Way A and Savanna (Continued)

22	Several small scattered clumps and individuals. All vegetative. *Nectar species:* None *Invasive species:* Morrow's honeysuckle, Kentucky blue grass
23	Several small clumps. All vegetative. *Nectar species:* flowering spurge *Invasive species:* Kentucky blue grass
24	Scattered, sparse, small individuals in population. All vegetative. *Nectar species:* sand cress, butterfly weed, sand coreopsis, flowering spurge, horse mint, common cinquefoil, black-eyed Susan *Invasive species:* Morrow's honeysuckle, Kentucky blue grass
25	Several plants within dense clump. One fruiting, the rest vegetative. *Nectar species:* None *Invasive species:* None

Miller Right-of-Way B

Seven populations of wild lupine observed.

Nectar species on site: sand cress, butterfly weed, New Jersey tea, sand coreopsis, tall coreopsis, flowering spurge, rough blazing star, hairy puccoon, horse mint, blackberry/dewberry/raspberry, black-eyed Susan, showy goldenrod

Invasive species on site: Hungarian brome, musk thistle, Morrow's honeysuckle, Tartarian honeysuckle, Canada blue grass, Kentucky blue grass

Population	Wild Lupine Notes
1	Three plants in clump. All vegetative. *Nectar species:* butterfly weed *Invasive species:* None
2	Somewhat dense, more dense at north end. All vegetative. Some oaks but not too dense, may eventually shade out lupine. *Nectar species:* butterfly weed, sand coreopsis, flowering spurge, hairy puccoon *Invasive species:* Morrow's honeysuckle, Canada blue grass, Kentucky blue grass
3	Scattered clumps within population. All vegetative. Black oak tops have died; resprouting and shrubby, shading out lupine. *Nectar species:* sand cress, New Jersey tea, tall coreopsis, flowering spurge, rough blazing star *Invasive species:* Morrow's honeysuckle, Kentucky blue grass
4	Scattered patches, more dense near middle in open areas. All vegetative. Black oak sprouts shading out lupine. *Nectar species:* sand cress, butterfly weed, New Jersey tea, sand coreopsis, tall coreopsis, flowering spurge, rough blazing star, hairy puccoon, horse mint, showy goldenrod *Invasive species:* Tartarian honeysuckle

Miller Right-of-Way B (Continued)

5	Patchy, most dense under sassafras. All vegetative. Dwarf honeysuckle, winged sumac, and sassafras, are dense and may choke out wild lupine. *Nectar species*: flowering spurge, horse mint, blackberry/dewberry/raspberry, black-eyed Susan, *Invasive species:* None
6	Several small clumps within population. All vegetative. Black oak, winged sumac, and sassafras shading out lupine. *Nectar species:* sand cress, flowering spurge, rough blazing star, hairy puccoon *Invasive species:* Kentucky blue grass
7	Several small clumps, more dense on east side. All vegetative. Willow, black oak and sassafras shading out lupine. *Nectar species:* tall coreopsis, flowering spurge, black-eyed Susan *Invasive species:* None

Miller Right-of-Way C

Three populations of wild lupine observed.

Nectar species on site: butterfly weed, New Jersey tea, sand coreopsis, flowering spurge, hairy puccoon, white sweet clover, horse mint, black-eyed Susan

Invasive species on site: Morrow's honeysuckle, Canada blue grass

Population	Wild Lupine Notes
1	Along fence at north end. Somewhat dense, mostly to west side of population. All vegetative. *Nectar species:* flowering spurge, hairy puccoon, horse mint *Invasive species:* Canada blue grass
2	Fairly dense, more dense at north side of population. All vegetative. *Nectar species*: hairy puccoon, horse mint *Invasive species:* Canada blue grass
3	Dense to south and north, somewhat sparse in center. Many fruited, most vegetative. *Nectar species:* butterfly weed, sand coreopsis, flowering spurge, hairy puccoon, horse mint, black-eyed Susan *Invasive species:* Morrow's honeysuckle, Canada blue grass

Stagecoach Road Right-of-Way A

Seven populations of wild lupine observed.

Nectar species on site: sand cress, butterfly weed, tall coreopsis, flowering spurge, rough blazing star, marsh blazing star, hairy puccoon, sweet clover, horse mint, blackberry/dewberry/raspberry, black-eyed Susan, showy goldenrod

Invasive species on site: quack grass, garlic mustard, Hungarian brome, Japanese chess, downy brome, ground ivy, sweet clover, Kentucky blue grass, Canada blue grass, bouncing bet

Population	Wild Lupine Notes
1	One small clump. Vegetative. Karner blue butterfly "window paning" on leaves. Population is being overgrown with non-native grasses. *Nectar species:* None *Invasive species:* quack grass, Hungarian brome, Kentucky blue grass
2	Fairly dense, especially in area shaded by black gum, black oak. All vegetative. *Nectar species*: sand cress, tall coreopsis, flowering spurge, hairy puccoon, sweet clover *Invasive species:* Kentucky blue grass
3	Dense throughout west and south ends, sparse and scattered to east. Few flowering, few fruiting, most vegetative. *Nectar species:* sand cress, rough blazing star, hairy puccoon, horse mint, blackberry/dewberry/raspberry *Invasive species:* downy brome, Kentucky blue grass
4	Fairly dense with large clumps at north end, scattered and few at south end. Few fruiting, most vegetative. *Nectar species:* flowering spurge, hairy puccoon, horse mint *Invasive species:* Kentucky blue grass
5	Dense at west end, scattered at east end. All vegetative. *Nectar species:* blackberry/dewberry/raspberry *Invasive species:* None
6	One large dense clump. Plants have fruited. *Nectar species:* None *Invasive species:* None
7	Most dense at west end, fairly dense throughout. Some have fruited, most vegetative. *Nectar species*: hairy puccoon, blackberry/dewberry/raspberry, showy goldenrod *Invasive species:* Canada blue grass, Kentucky blue grass

Stagecoach Road Right-of-Way B

Four populations of wild lupine observed.

Nectar species on site: flowering spurge, hairy puccoon, sweet clover, horse mint, blackberry/dewberry/raspberry

Invasive species on site: Hungarian brome, Japanese chess, downy brome, oriental bittersweet, bouncing bet, white stonecrop

Population	Wild Lupine Notes
1	Scattered clumps within population, most dense at north side and in center of south side. Some has fruited, most vegetative. *Nectar species:* blackberry/dewberry/raspberry *Invasive species:* None
2	One plant, fruiting. *Nectar species:* None *Invasive species:* None
3	2 small plants, vegetative. *Nectar species:* None *Invasive species:* None
4	Sparse along south and west boundaries, dense clumps throughout rest of population. A few have fruited, most vegetative. *Nectar species:* horse mint, blackberry/dewberry/raspberry *Invasive species:* Hungarian brome, Japanese chess, downy brome

Stagecoach Road Right-of-Way C

Three populations of wild lupine observed.

Nectar species on site: sand cress, butterfly weed, sand coreopsis, flowering spurge, hairy puccoon, horse mint, common cinquefoil, blackberry/dewberry/raspberry

Invasive species on site: quack grass, Hungarian brome, Japanese chess, downy brome, orange day lily, Tartarian honeysuckle, sweet clover, Kentucky blue grass, black locust

Population	Wild Lupine Notes
1	Dense at north end, sparse and scattered at south end of population. One flowering, none fruiting, mostly vegetative. *Nectar species:* sand cress, flowering spurge, hairy puccoon, horse mint *Invasive species:* downy brome, Kentucky blue grass, both fairly dense
2	Sparse throughout most of population, fairly dense at north end of population. None flowering, few fruiting, mostly vegetative. *Nectar species:* butterfly weed, sand coreopsis, flowering spurge, hairy puccoon, blackberry/dewberry/raspberry *Invasive species:* downy brome, Kentucky blue grass
3	One clump. All vegetative. *Nectar species:* None *Invasive species:* Japanese chess, downy brome

APPENDIX D – KARNER BLUE BUTTERFLY POPULATION MAPS

NiSource
2004 Baseline Monitoring Report
Wild Lupine and Karner Blue Butterfly Survey

Sheet 1: **Karner Blue Butterfly Survey Results**
Aetna A Right-of-Way
NiSource
Lake and Porter Counties, Indiana

N

Scale: 1" = 200'

JFNew #02-04-13M2-3

JFNew
708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com

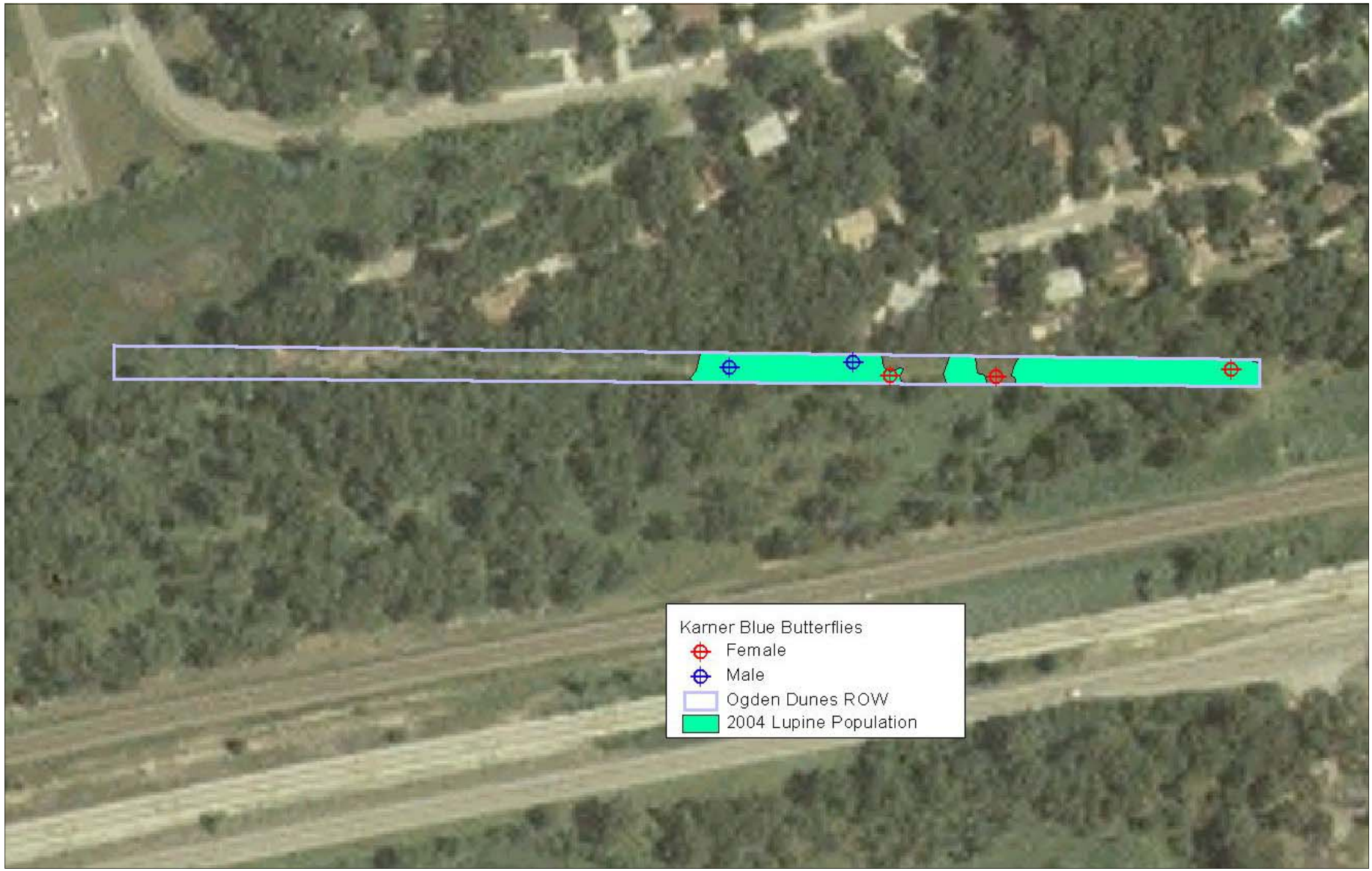
Sheet 2: **Karner Blue Butterfly Survey Results**
Aetna B Right-of-Way
NiSource
Lake and Porter Counties, Indiana

N

Scale: 1" = 200'

JFNew #02-04-13M2-3

JFNew
708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com



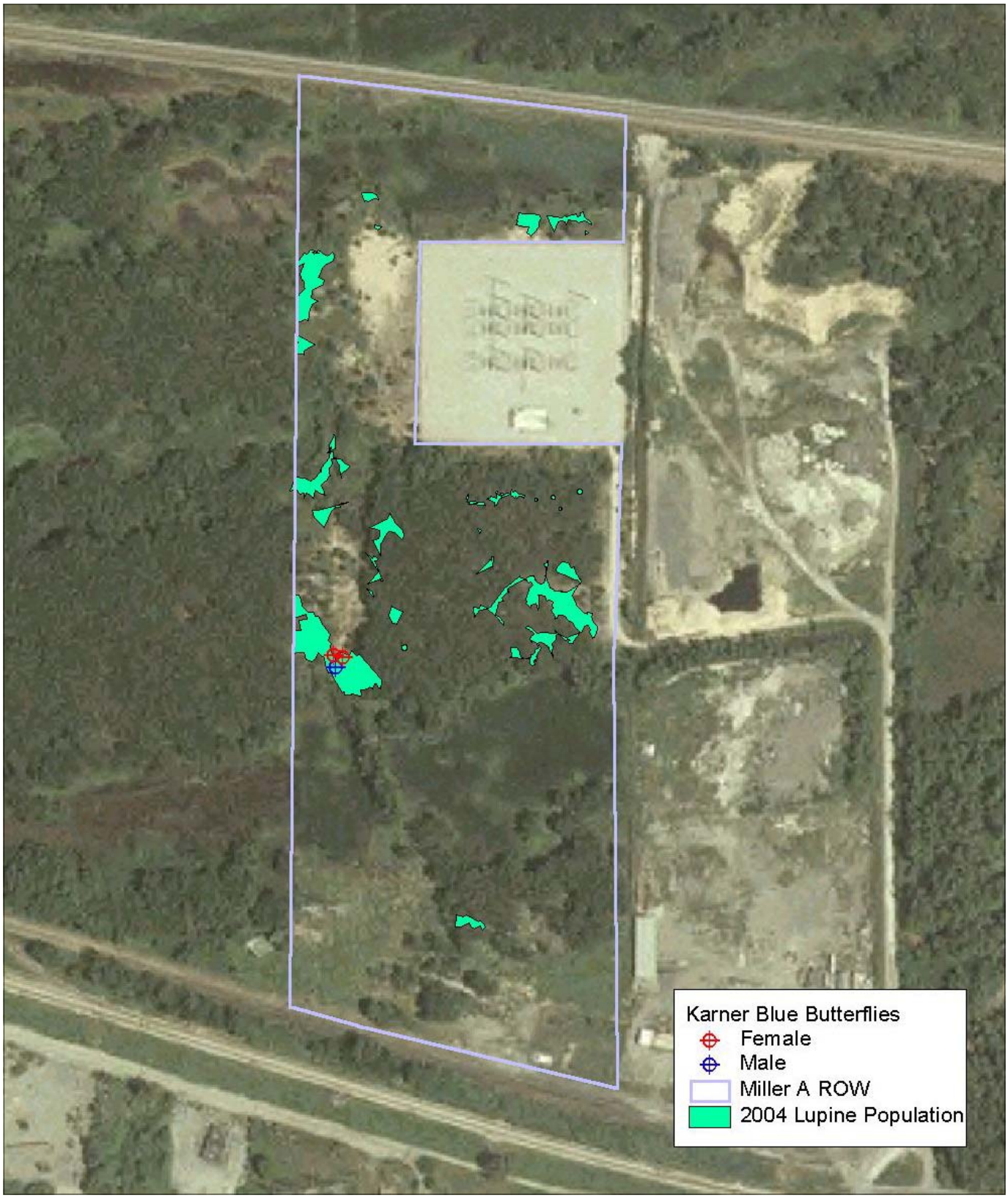
Sheet 3: **Karner Blue Butterfly Survey Results**
Ogden Dunes Right-of-Way
NiSource
Lake and Porter Counties, Indiana

N

Scale: 1" = 200'

JFNew #02-04-13M2-3

JFNew
708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com



Sheet 4: **Karner Blue Butterfly Survey Results**
Miller A Right-of-Way
NiSource
Lake and Porter Counties, Indiana

N

Scale: 1" = 300'

JFNew #02-04-13M2-3

JFNew
708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com

Sheet 5: **Karner Blue Butterfly Survey Results**
Miller B Right-of-Way
NiSource
Lake and Porter Counties, Indiana

N

Scale: 1" = 200'

JFNew #02-04-13M2-3

JFNew
708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com

Sheet 6: **Karner Blue Butterfly Survey Results**
Miller C Right-of-Way
NiSource
Lake and Porter Counties, Indiana

N

Scale: 1" = 200'

JFNew #02-04-13M2-3

JFNew
708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com

Sheet 7: **karner Blue Butterfly Survey Results**
Stagecoach A Right-of-Way
NiSource
Lake and Porter Counties, Indiana

N

Scale: 1" = 400'

JFNew #02-04-13M2-3

JFNew
708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com

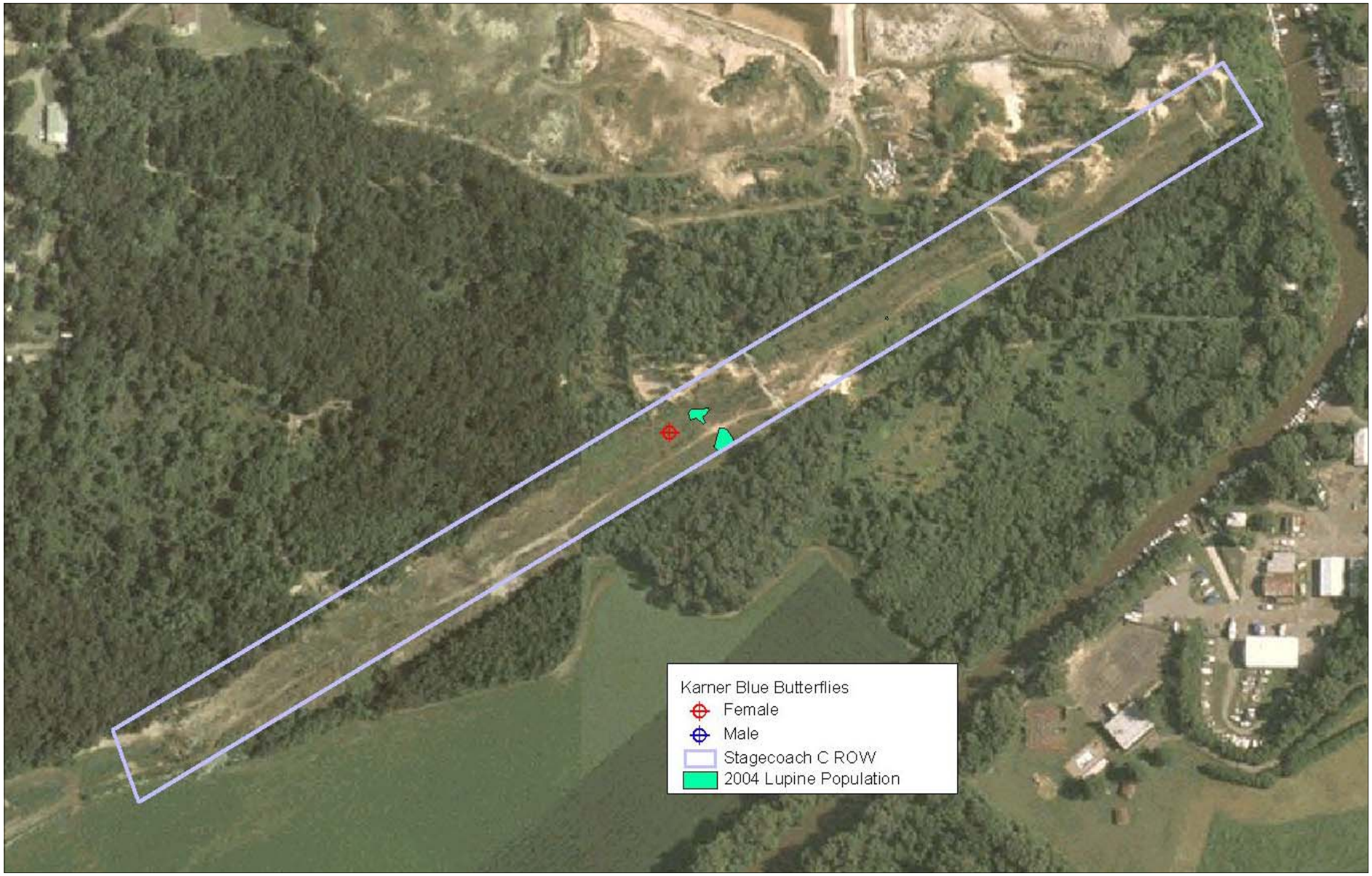
Sheet 8: **Karner Blue Butterfly Survey Results**
Stagecoach B Right-of-Way
NiSource
Lake and Porter Counties, Indiana

N

Scale: 1" = 200'

JFNew #02-04-13M2-3

JFNew
708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com



Sheet 9: **Karner Blue Butterfly Survey Results**
Stagecoach C Right-of-Way
NiSource
Lake and Porter Counties, Indiana

N

Scale: 1" = 400'

JFNew #02-04-13M2-3

JFNew
708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com

APPENDIX E – PHOTOGRAPHS

NiSource
2004 Baseline Monitoring Report
Wild Lupine and Karner Blue Butterfly Survey

Wild lupine flowering and fruiting during wild lupine surveys.

Site Photographs **June 23-25, 2004** **Wild Lupine/KBB Surveys** **NiSource** **Lake and Porter Counties, Indiana**	JFNew #02-04-13M2-3	JFNew 708 Roosevelt Road, Walkerton, IN 46574 Phone 574-586-3400 / Fax 574-586-3446 www.jfnew.com

Karner blue butterflies observed during first brood on Miller ROW A (male above, female below).

Site Photographs **July 19, 2004** **Wild Lupine/KBB Surveys** **NiSource** **Lake and Porter Counties, Indiana**	JFNew #02-04-13M2-3	JFNew 708 Roosevelt Road, Walkerton, IN 46574 Phone 574-586-3400 / Fax 574-586-3446 www.jfnew.com

Typical views of Aetna ROW A

Site Photographs **June 23-25, 2004** **Wild Lupine/KBB Surveys** **NiSource** **Lake and Porter Counties, Indiana**	JFNew #02-04-13M2-3	JFNew 708 Roosevelt Road, Walkerton, IN 46574 Phone 574-586-3400 / Fax 574-586-3446 www.jfnew.com

Typical views of Aetna ROW B.

Site Photographs **June 23-25, 2004** **Wild Lupine/KBB Surveys** **NiSource** **Lake and Porter Counties, Indiana**	JFNew #02-04-13M2-3	JFNew 708 Roosevelt Road, Walkerton, IN 46574 Phone 574-586-3400 / Fax 574-586-3446 www.jfnew.com

Typical views of Ogden Dunes ROW.

Site Photographs **June 23-25, 2004** **Wild Lupine/KBB Surveys** **NiSource** **Lake and Porter Counties, Indiana**	JFNew #02-04-13M2-3	JFNew 708 Roosevelt Road, Walkerton, IN 46574 Phone 574-586-3400 / Fax 574-586-3446 www.jfnew.com

Typical views of Miller ROW A.

Site Photographs
June 23-25, 2004
Wild Lupine/KBB Surveys
NiSource
Lake and Porter Counties, Indiana

JFNew #02-04-13M2-3

JFNew
708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com

Typical view of Miller ROW B.

Typical view of Miller ROW C.

Site Photographs **June 23-25, 2004** **Wild Lupine/KBB Surveys** **NiSource** **Lake and Porter Counties, Indiana**	JFNew #02-04-13M2-3	JFNew 708 Roosevelt Road, Walkerton, IN 46574 Phone 574-586-3400 / Fax 574-586-3446 www.jfnew.com

Typical views of Stagecoach Road ROW A.

Site Photographs
June 23-25, 2004
Wild Lupine/KBB Surveys
NiSource
Lake and Porter Counties, Indiana

JFNew #02-04-13M2-3

JFNew
708 Roosevelt Road, Walkerton, IN 46574
Phone 574-586-3400 / Fax 574-586-3446
www.jfnew.com

Typical views of Stagecoach Road ROW B.

Site Photographs **June 23-25, 2004** **Wild Lupine/KBB Surveys** **NiSource** **Lake and Porter Counties, Indiana**	JFNew #02-04-13M2-3	JFNew 708 Roosevelt Road, Walkerton, IN 46574 Phone 574-586-3400 / Fax 574-586-3446 www.jfnew.com

Typical views of Stagecoach Road ROW C.

Site Photographs **June 23-25, 2004** **Wild Lupine/KBB Surveys** **NiSource** **Lake and Porter Counties, Indiana**	JFNew #02-04-13M2-3	JFNew 708 Roosevelt Road, Walkerton, IN 46574 Phone 574-586-3400 / Fax 574-586-3446 www.jfnew.com

APPENDIX C:

US FISH AND WILDLIFE SERVICE PERMIT APPLICATION FOR INCIDENTAL TAKE PERMIT FORM (3-200)

Department of the Interior
U.S. Fish and Wildlife Service

Expires (2/28/01)
OMB No. 1018-0094

FEDERAL FISH AND WILDLIFE LICENSE/PERMIT APPLICATION FORM

RETURN TO:

Type of Activity:

3-200-56 NATIVE ENDANGERED AND THREATENED SPECIES - INCIDENTAL TAKE

A.	**COMPLETE IF APPLYING AS AN INDIVIDUAL**		
1. Name:			
2. Street address:			3. County:
4. City, State, Zip code:			
5. Date of birth:	6. Social Security No.:	7. Occupation:	
8. List any business, agency, organizational, or institutional affiliation associated with the wildlife to be covered by this license or permit:			
9. Home telephone number:	10. Work telephone number:	11. Fax number:	12. E:mail address:

B.	**COMPLETE IF APPLYING AS A BUSINESS, CORPORATION, PUBLIC AGENCY OR INSTITUTION**		
1. Name of business, agency or institution: Northern Indiana Public Service Company			2. Tax identification no.: 350552990
3. Street address: 801 East 86th Avenue			4. County: Lake
5. City, State, Zip code: Merrillville, Indiana 46410			
6. Describe the type of business, agency, or institution: Electric and Natural Gas Utility			
7. Name and title of person responsible for permit (president, principal officer, director, etc.): Ronald J. Ragains, Director, Construction			
8. Home telephone number:	9. Work telephone number: 219-938-7698	10. Fax number: 219-938-7694	11. E:mail address: RJRagains@NiSource.com

C.	**ALL APPLICANTS COMPLETE**
1. Do you currently have or have you had any Federal Fish and Wildlife License or Permit? Yes ☐ No ☒ If yes, list license or permit numbers:	
2. Have you obtained any required state or foreign government approval to conduct the activity you propose? Yes ☐ No ☐ Not required ☒ If yes, provide a copy of the license or permit.	
3. Enclose check or money order payable to the U.S. FISH AND WILDLIFE SERVICE in the amount of $25. Institutions which qualify under 50 CFR 13.11(d)(3) may be exempt from fees.	
4. ATTACHMENTS: Complete the additional pages of this application. Application will not be considered complete without these pages. Incomplete applications may be returned.	
5. **CERTIFICATION:** I hereby certify that I have read and am familiar with the regulations contained in Title 50, Part 13, of the Code of Federal Regulations and the other applicable parts in subchapter B of Chapter I of Title 50, and I further certify that the information submitted in this application for a license or permit is complete and accurate to the best of my knowledge and belief. I understand that any false statement herein may subject me to the criminal penalties of 18 U.S.C. 1001.	
6. Signature (in ink) of applicant or person responsible for permit in Block A or B Ronald J. Ragains	7. Date: April 29, 2005

Form 3-200-56 Rev. (2/98)

Department of the Interior
U.S. Fish and Wildlife Service

Expires (2/28/01)
OMB No. 1018-0094

FEDERAL FISH AND WILDLIFE LICENSE/PERMIT APPLICATION FORM

RETURN TO:

Type of Activity:

3-200-56 NATIVE ENDANGERED AND THREATENED SPECIES - INCIDENTAL TAKE

A.	**COMPLETE IF APPLYING AS AN INDIVIDUAL**		
1. Name:			
2. Street address:			3. County:
4. City, State, Zip code:			
5. Date of birth:	6. Social Security No.:	7. Occupation:	
8. List any business, agency, organizational, or institutional affiliation associated with the wildlife to be covered by this license or permit:			
9. Home telephone number:	10. Work telephone number:	11. Fax number:	12. E:mail address:

B.	**COMPLETE IF APPLYING AS A BUSINESS, CORPORATION, PUBLIC AGENCY OR INSTITUTION**		
1. Name of business, agency or institution: **Indiana-American Water Company, Inc. (INAWC)**			2. Tax identification no.: **35-0936102/0**
3. Street address: **PO Box 64486, 650 Madison Street**			4. County: **Lake**
5. City, State, Zip code: **Gary, IN 46401-0486**			
6. Describe the type of business, agency, or institution: **Municipal Water Utility**			
7. Name and title of person responsible for permit (president, principal officer, director, etc.): **R. Douglas Mitchem, V.P. Operations**			
8. Home telephone number:	9. Work telephone number: **314-996-2357**	10. Fax number: **314-432-7824**	11. E:mail address: **dmitchem@amwater.com**

C.	**ALL APPLICANTS COMPLETE**
1. Do you currently have or have you had any Federal Fish and Wildlife License or Permit? Yes ☐ No ☒ If yes, list license or permit numbers:	
2. Have you obtained any required state or foreign government approval to conduct the activity you propose? Yes ☐ No ☐ Not required ☒ If yes, provide a copy of the license or permit.	
3. Enclose check or money order payable to the U.S. FISH AND WILDLIFE SERVICE in the amount of $25. Institutions which qualify under 50 CFR 13.11(d)(3) may be exempt from fees.	
4. ATTACHMENTS: Complete the additional pages of this application. Application will not be considered complete without these pages. Incomplete applications may be returned.	
5. **CERTIFICATION:** I hereby certify that I have read and am familiar with the regulations contained in Title 50, Part 13, of the Code of Federal Regulations and the other applicable parts in subchapter B of Chapter I of Title 50, and I further certify that the information submitted in this application for a license or permit is complete and accurate to the best of my knowledge and belief. I understand that any false statement herein may subject me to the criminal penalties of 18 U.S.C. 1001.	
6. Signature (in ink) of applicant or person responsible for permit in Block A or B	7. Date: 4/18/05

Form 3-200-56 Rev. (2/98)

Endangered Species Incidental Take Permits

For Incidental Take Permit applications, the following specific information must be provided in addition to the general information on page one of this application:

1. ☐ Physical address or location of activities: Section/Township/Range, County tax parcel number, or other formal legal description.

2. ☐ A complete description of activity(ies) to be authorized.

3. ☐ The common and scientific names of the species sought to be covered by the permit, as well as, the number, age, and sex of such species, if known.

4. ☐ A conservation plan that specifies:

   a. The impact that will likely result from the incidental taking.

   b. What steps will be taken to monitor, minimize, and mitigate such impacts, the funding that will be available to implement such steps, and the procedures to deal with unforseen circumstances.

   c. What alternative actions to such incidental taking have been considered and the reasons why these alternatives are not proposed for use.

5. ☐ A certification notice that states: By submitting this application and receiving an incidental take permit pursuant to Section 10(a)(1)(B) of the Endangered Species Act, the landowner/permittee agrees that he/she owns the lands indicated in this application, or has sufficient authority or rights over these lands to implement the measures of the Habitat Conservation Plan. Further, upon receipt of the incidental take permit, the permittee signing Form 3-200 will conduct the activities as specified in the Habitat Conservation Plan and implementation agreement according to the terms and conditions, of the permit and supporting documents.

The public reporting burden for these reporting requirements is estimated to be 2.5 hours, including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the forms. Comments regarding the burden estimate or any other aspect of the reporting requirement(s) should be directed to the Service Information Collection Clearance Officer, MS 224 ARLSQ, Fish and Wildlife Service, Washington, DC 20240, or the Office of Management and Budget, Attention: Desk Officer for the Department of the Interior; Washington, DC 20503.

An agency may not conduct and a person is not required to respond to a collection of information unless a currently valid OMB control number is displayed.

NOTICE TO:
APPLICANTS FOR FEDERAL FISH AND WILDLIFE LICENCES/PERMITS

PRIVACY ACT- NOTICE

In accordance with the Privacy Act of 1974 (S U.S.C. 552a), please be advised that:

1. The gathering of information on fish and wildlife is authorized by: (a) Bald Eagle Protection Act (16 U.S.C. 663a); (b) Endangered Species Act of 1973 (16 U.S.C. 1539); (c) Migratory Bird Treaty Act (16 U.S.C. 703-711); (d) Marine Mammal Protection Act of 1972 (16 U.S.C. 1371-1383); (e) Lacey Act (18 U.S.C. 42 & 4 4); and (f) Title 50, Part 13, Code of the Code of Federal Regulations.

2. Submission of requested information is required in order to process applications for licenses or permits authorized under the above acts. With the exception of your social security number, failure to provide all requested information may be sufficient cause for the U.S. Fish and Wildlife Service to deny a permit.

3. Applications for licenses or permits authorized under the Endangered Species Act of 1973 (16 U.S.C. 1539) and the Marine Mammal Protection Act of 1972 (16 U.S.C. 1371-1383) may be published in the *Federal Register* as required by the two acts.

4. In the event a violation of a statute, regulations, rule, order, or license, whether civil, criminal, or regulatory in nature is discovered during the application review process, the requested information may be transferred to the appropriate Federal, State, local, or foreign agency charged with investigating or prosecuting such violations.

5. In the event of litigation involving the records or the subject matter of the records, the requested information may be transferred to the U.S. Department of Justice or appropriate law enforcement authorities.

6. Information provided in the application may be disclosed to subject matter experts, and State and other Federal agencies, for the sole purpose of obtaining advise relevant to issuance of the permit.

7. For individuals, personal information such as home address and telephone number, financial data, and personal identifiers (social security number, birth date, etc.) will be removed prior to any release of the application.

FREEDOM OF INFORMATION ACT- NOTICE

8. For organizations, businesses, or individuals operating as a business (i.e., permittees not covered by the Privacy Act), we request that you identify any information that should be

considered privileged and confidential business information to allow the Service to meet its responsibilities under FOIA. Confidential business information must be clearly marked "Business Confidential" at the top of the letter or page and each succeeding page, and must be accompanied by a nonconfidential summary of the confident information. The nonconfidential summary and remaining documents may be made available to the public under FOIA [43 CFR 2.13(c)(4), 43 CFR 2.15(d)(1)(i)].

NOTICE TO:
APPLICANTS FOR FEDERAL FISH AND WILDLIFE LICENSES/PERMITS (CONT.)

APPLICATION FEE- NOTICE

There is a $25.00 processing fee for incidental take permit applications under the Endangered Species Act [50 CFR 17.22(b) and 50 CFR 17.32(b)]. The fee applies to permit applications, renewals, and amendments.

A check (it does not need to be certified) or money order should be made payable to the **"U.S. Fish and Wildlife Service"**. The processing fee will not be refunded if the permit application is abandoned or the permit is issued or denied. The fee may be refunded if the permit application is withdrawn in writing before significant processing has occurred.

Fee Exemption: State or local government agencies or individuals or institutions under contract to such agencies for proposed activities are exempt from paying this fee. Until further notice, the fee will be waived for public institutions. As defined in 50 CFR 10.12, the term "public" as used in reference to museums, zoological parks, and scientific institutions, refers to such as are open to the general public and are privately owned and organized but are not operated for profit.

APPENDIX D:

IMPLEMENTING AGREEMENT

IMPLEMENTING AGREEMENT

by and between

NORTHERN INDIANA PUBLIC SERVICE COMPANY
"NIPSCO"

INDIANA - AMERICAN WATER COMPANY, INC
"INAWC"

U.S. FISH AND WILDLIFE
"Service"

TO ESTABLISH A MITIGATION PROGRAM FOR THE ENDANGERED KARNER BLUE BUTTERFLY

AT THE PROPOSED NIPSCO & INAWC RIGHTS-OF-WAY

NIPSCO MILLER ROW located in Section 1, Township 36 North, Range 8 West, Lake County, Indiana
NIPSCO AETNA ROW located in Section 12, Township 36 North, Range 8 West, Lake County, Indiana
NIPSCO STAGECOACH ROAD ROW located in Sections 2&3 Township 36 North, Range 7 West, and Sections 35&36 Township 37North, Range 7 West, Porter County, Indiana; and

INAWC OGDEN DUNES ROW
located in Section 35, Township 37 North, Range 7 West, Porter County, Indiana.

This Implementing Agreement ("Agreement"), made and entered into as of the ___ day of _____, 2005 by and among NIPSCO, INAWC and the Service hereinafter collectively called the "Parties," defines the Parties' roles and responsibilities and provides a common understanding of action that will be undertaken to minimize and mitigate the effects on the Karner Blue Butterfly and its habitats within the proposed NIPSCO MILLER ROW, NIPSCO AETNA ROW, NIPSCO STAGECOACH ROAD ROW and INAWC OGDEN DUNES ROW (sometimes referred to herein collectively as the "Rights of Way").

1.0 RECITALS

This Agreement is entered into with regard to the following facts:

WHEREAS, the proposed Rights of Way locations have been selected after an environmental review has determined them to be current or potential habitat for the federally listed Karner Blue Butterfly; and,

WHEREAS, NIPSCO and INAWC, with technical assistance from the Service, has developed a series of measures, described in the Conservation Plan (as defined herein), to minimize and mitigate the effects upon the Karner Blue Butterfly and its associated habitats arising due to usage of the proposed Rights of Way; and,

THEREFORE, the Parties hereto do hereby understand and agree as follows:

2.0 DEFINITIONS

The following terms as used in this Agreement shall have the meanings set forth below:

2.1 The term "Permit" shall mean an incidental take permit issued by the Service to NIPSCO and INAWC pursuant to Section 10(a)(1)(B) of the Endangered Species Act ("ESA").

2.2 The term "Permit Area" shall mean the areas consisting of: approximately 37 acres of the NIPSCO MILLER ROW, located in Section 1, Township 36 North, Range 8 West, Lake County, Indiana; approximately 15 acres of the NIPSCO AETNA ROW located in Section 12, Township 36 North, Range 8 West, Lake County, Indiana; approximately 32 acres of the NIPSCO STAGECOACH ROAD ROW located in Sections 2&3, Township 36 North, Range 7 West, and Sections 35&36, Township 37 North, Range 7 West, Porter County, Indiana, and the INAWC OGDEN DUNES ROW located in Section 35, Township 37 North, Range 7 West, Porter County, Indiana**;** all as more specifically depicted in Appendix A, Figures 2 & 3 of the Conservation Plan.

2.3 The term "Permittee" shall mean NIPSCO and INAWC individually and the term "Permittees" shall mean NIPSCO and INAWC collectively.

2.4 The term "Conservation Plan" shall mean the Karner Blue Butterfly Habitat Conservation Plan prepared by the Permittees for the proposed routine usage of the Permit Areas of the Rights-of-Way.

2.5 The term "Plan Species" shall mean the Karner Blue Butterfly as covered in the Conservation Plan.

2.6 The term "unforeseen circumstances" means any significant, unanticipated adverse change in the status of the Karner Blue Butterfly addressed in the Conservation Plan or in its habitats; or any significant unanticipated adverse change in impacts of the project or in other factors upon which the Conservation Plan is based. The term "unforeseen circumstances" as defined in this Agreement is intended to have the same meaning as "extraordinary circumstances" as used in the Services' so called "No Surprises" policy.

3.0 CONSERVATION PLAN

Pursuant to the provisions of Section 10(a)(1)(B) of the ESA, the Permittees have prepared the Conservation Plan and submitted it to the Service with a request that the Service issue a Permit to allow the Plan Species to be incidentally taken within the Permit Area as depicted and described in Appendix A, Figures 2 & 3 of the Conservation Plan. The Conservation Plan proposes a mitigation program for the subject Plan Species and its habitats.

4.0 INCORPORATION OF CONSERVATION PLAN
The Conservation Plan and each of its provisions are intended to be, and by this reference are, incorporated herein. In the event of any direct contradiction between the terms of this Agreement and the Conservation Plan, the terms of this Agreement shall control. In all other cases, the terms of this Agreement and the terms of the Conservation Plan shall be interpreted to be supplementary to each other.

5.0 LEGAL REQUIREMENTS
In order to fulfill the requirements that will allow the Service to issue the Permit, the Conservation Plan sets forth measures that are intended to ensure that any take occurring within the Permit Area will be incidental; that the impacts of the take will, to the maximum extent practicable, be minimized and mitigated; that procedures to deal with unforeseen circumstances will be provided; that adequate funding for the Conservation Plan be provided; and that the take will not appreciably reduce the likelihood of the survival and recovery of the Plan Species in the wild. It also includes measures that have been suggested by the Service as being necessary or appropriate for purposes of the Conservation Plan.

6.0 COOPERATIVE EFFORT In order that each of the legal requirements as set forth in Paragraph 5.0 hereof are fulfilled, each of the Parties to this Agreement must perform certain specific tasks as more particularly set forth in the Conservation Plan. The Conservation Plan thus describes a cooperative program by and among the Service and private interests to mitigate the effects of the proposed activities on the Plan Species.

7.0 TERMS USED
Terms defined and utilized in the Conservation Plan and the ESA shall have the same meaning when utilized in this Agreement, except as specifically noted.

8.0 PURPOSES
The purposes of this Agreement are:

8.1 To ensure implementation of each of the terms of the Conservation Plan;

8.2 To describe remedies and recourse should any Party fail to perform its obligations, responsibilities, and tasks as set forth in this Agreement; and,

8.3 As stated in paragraph 12.3.a hereof, to provide assurances to the Permittees and other non-Federal landowner(s) participating in the Conservation Plan that as long as the terms of the Conservation Plan and the Permit issued pursuant to the Conservation Plan and this Agreement are fully and faithfully performed, no additional mitigation will be required except as otherwise expressly provided for in this Agreement or required by law.

9.0 TERMS AND CONDITIONS

9.1 Stated Term. This Agreement shall become effective on the date that the Service issues the Permit requested in the Conservation Plan and shall remain in full force and effect for a period of 25 years or until termination of the Permit, whichever occurs sooner (the “Term”).

10.0 FUNDING

10.1 NIPSCO & INAWC will each provide such funds as may be necessary to carry out its obligations under the Conservation Plan. Each Permittee should notify the Service, if the Permittee's funding resources have materially adversely changed, including a discussion of the nature of the change, from the information provided in section 6 of the Conservation Plan.

11.0 RESPONSIBILITIES OF THE PARTIES IN MITIGATION PROGRAM IMPLEMENTATION AND MONITORING RESPONSIBILITIES OF THE PERMITTEE

11.1 Responsibilities of each Permittee.

a. Each Permittee acknowledges that the Conservation Plan will be properly functioning if the terms of this Agreement have been or are being fully implemented.
b. Each Permittee shall undertake all activities set forth in the Conservation Plan in order to meet the terms of the Conservation Plan and to comply with the Permit, including adaptive management procedures described in subparagraph (c) below, if applicable.
c. Upon the written request from the Service, each Permittee shall describe the adaptive management process agreed to by the Parties to ensure the terms of the Conservation Plan are fully implemented, if applicable.
d. The Permittees shall submit an annual report describing its activities and an analysis of whether the terms of the Conservation Plan were met for the reporting period. The report shall provide all reasonably available data regarding the incidental take, and where requested in writing by the Service, changes to the overall population of Plan Species that occurred in the Permit Area during the reporting period. In the case of a corporate Permittee, the report shall also include the following certification from a responsible company official who supervised or directed the preparation of the report: Under penalty of law, I certify that, to the best of my knowledge, after appropriate inquiries of all relevant persons involved in the preparation of this report, the information submitted is true, accurate, and complete in all material respects.

11.2 Responsibilities of the Service.

a. The Service shall cooperate and provide, to the extent funding is available, technical assistance to each Permittee. Nothing in this Agreement shall require the Service to act in a manner contrary to the requirements of the Anti-Deficiency Act.
b. After issuance of the Permit, the Service shall monitor the implementation thereof, including each of the terms of this Agreement and the Conservation Plan in order to ensure compliance with the Permit, the Conservation Plan and this Agreement by each Permittee.

12.0 REMEDIES AND ENFORCEMENT

12.1 REMEDIES IN GENERAL

Except as set forth below, each Party shall have all remedies available at law and in equity to enforce the terms of this Agreement, the Permit, and the Conservation Plan, and to seek remedies for any breach hereof, subject to the following:

a. NO MONETARY DAMAGES

No Party shall be liable in damages to any other Party or other person for any breach of this Agreement, any performance or failure to perform a mandatory or discretionary obligation imposed by this Agreement or any other cause of action arising from this Agreement. Notwithstanding the foregoing:

(1) Retain Liability

All Parties shall retain whatever civil liability they would possess to any other Party or other person for their present and future acts or failure to act without existence of this Agreement.

(2) Land Owner Liability

All Parties shall retain whatever liability they possess as an owner of interests in land.

(3) Responsibility of the United States

Nothing contained in this Agreement is intended to limit the authority of the United States government to seek civil or criminal penalties or otherwise fulfill its enforcement responsibilities under the ESA.

The Parties acknowledge that any take of endangered or threatened species in compliance with this Agreement, the Conservation Plan, and the Permit shall not be a violation of the ESA.

b. INJUNCTIVE AND TEMPORARY RELIEF

The Parties acknowledge that the Plan Species are unique and that their loss as species would result in irreparable damage to the environment and that therefore injunctive and temporary relief may be appropriate to ensure compliance with the terms of this Agreement.

12.2 THE PERMIT

a. SEVERABILITY

The violation of the Permit by any Permittee with respect to any one or more particular parcels of land or portions thereof owned or controlled or within the jurisdiction of any such Permittee including the Rights of Way shall not adversely affect or be attributed to, nor shall it result in a loss or diminution of any right, privilege, or benefit hereunder, of any other Permittee.

b. PERMIT SUSPENSION OR REVOCATION

Except as otherwise expressly provided for under the terms of this Agreement, the Permit shall be suspended or revoked to the extent required by and in conformance with the provisions of 50 CFR 13.27 through 13.29 (1994), as the same exists as of the date hereof.

12.3 LIMITATIONS AND EXTENT OF ENFORCEABILITY

a. NO SURPRISES POLICY

Subject to the availability of appropriated funds as provided in Paragraph 14.6 hereof, and except as otherwise required by law, no further mitigation for the effects of the proposed activity upon the Plan Species may be required from a Permittee who has otherwise abided by the terms of the Conservation Plan, except in the event of unforeseen circumstances; provided that any such additional mitigation may not require additional land use restrictions or financial compensation from the Permittee without his/her written consent.

b. PRIVATE PROPERTY RIGHTS AND LEGAL AUTHORITIES UNAFFECTED

Except as otherwise specifically provided herein, nothing in this Agreement shall be deemed to restrict the rights of a Permittee to the use or develop those lands, or interests in lands, constituting the Permit Area; provided, that nothing in this Agreement shall absolve a Permittee from such other limitations as may apply to such lands, or interests in lands, under other laws of the United States and the State of Indiana.

13.0 AMENDMENTS

Except as otherwise set forth herein, this Agreement may be amended consistent with the ESA and with the written consent of each of the Parties hereto.

14.0 MISCELLANEOUS PROVISIONS

14.1 NO PARTNERSHIP

Except as otherwise expressly set forth herein, neither this Agreement nor the Conservation Plan shall make or be deemed to make any Party to this Agreement the agent or the partner of any other Party.

14.2 SUCCESSORS AND ASSIGNS

This Agreement and each of its covenants and conditions shall be binding on and shall inure to the benefit of the Parties hereto and their respective successors and assigns.

14.3 NOTICE

Any notice permitted or required by this Agreement shall be delivered personally to the persons set forth below or shall be deemed given five (5) days after deposit in the United States mail, certified and postage prepaid, return receipt requested and addressed as follows or at such other address as any Party may from time to time specify to the other Parties in writing:

Robyn Thorson
Regional Director
United States Fish and Wildlife Service
Federal Building
1 Federal Drive
Fort Snelling, Minnesota 55111
612-713-5301

Brian Kortum
Natural Resources Specialist
Northern Indiana Public Service Company
NiSource EH&S
801 East 86th Street
Merrillville, IN 46410
219-647-5273

R. Douglas Mitchem
Vice President of Operations
Indiana-American Water Company, Inc.
535 North New Ballas Rd.
St. Louis, MO 63141
314.996.2357

14.4 ENTIRE AGREEMENT
This Agreement, together with the Conservation Plan and the Permit, constitutes the entire agreement between the Parties. It supersedes any and all other agreements, either oral or in writing among the Parties with respect to the subject matter hereof and contains all of the covenants and agreements among them with respect to said matters, and each Party acknowledges that no representation, inducement, promise or agreement, oral or otherwise, has been made by any other Party or anyone acting on behalf of any other Party that is not embodied herein.

14.5 ELECTED OFFICIALS NOT TO BENEFIT
No member of or delegate to Congress shall be entitled to any share or part of this Agreement, or to any benefit that may arise from it.

14.6 AVAILABILITY OF FUNDS
Implementation of this Agreement and the Conservation Plan by the Services is subject to the requirements of the Anti-Deficiency Act and the availability of appropriated funds. Nothing in this Agreement will be construed by the Parties to require the obligation, appropriation, or expenditure of any money from the U.S. treasury. The Parties acknowledge that the Services will not be required under this Agreement to expend any Federal agency's appropriated funds unless and until an authorized official of that agency affirmatively acts to commit to such expenditures as evidenced in writing.

14.7 DUPLICATE ORIGINALS
This Agreement may be executed in any number of duplicate originals. A complete original of this Agreement shall be maintained in the official records of each of the Parties hereto.

14.8 THIRD PARTY BENEFICIARIES
Without limiting the applicability of the rights granted to the public pursuant to the provisions of 16 U.S.C. § 1540(g), this Agreement shall not create any right or interest in the public, or any member thereof, as a third party beneficiary hereof, nor shall it authorize anyone not a Party to this Agreement to maintain a suit for personal injuries or property damages pursuant to the provisions of this Agreement. The duties, obligations, and responsibilities of the Parties to this Agreement with respect to third parties shall remain as imposed under existing Federal or State law.

14.9 RELATIONSHIP TO THE ESA AND OTHER AUTHORITIES
The terms of this Agreement shall be governed by and construed in accordance with the ESA and other applicable laws. In particular, nothing in this Agreement is intended to limit the authority of the Service to seek penalties or otherwise fulfill its responsibilities under the ESA. Moreover, nothing in this Agreement is intended to limit or diminish the legal obligations and responsibilities of the Service as an agency of the Federal government.

14.10 REFERENCES TO REGULATIONS
Any reference in this Agreement, the Conservation Plan, or the Permit to any regulation or rule of the Service shall be deemed to be a reference to such regulation or rule in existence at the time an action is taken.

14.11 APPLICABLE LAWS
All activities undertaken pursuant to this Agreement, the Conservation Plan, or the Permit must be in compliance with all applicable State and Federal laws and regulations.

IN WITNESS WHEREOF, THE PARTIES HERETO have executed this Agreement to be in effect as of the date last signed below.

BY _____ Date _____
Robyn Thorson, Regional Director
United States Fish and Wildlife Service

BY _____ Date _____
Ronald J. Ragains, Director, Construction
Northern Indiana Public Service Company

BY _____ Date _____
R. Douglas Mitchem
Vice President of Operations
Indiana-American Water Company, Inc

APPENDIX E:

PHOTOS OF EQUIPMENT POTENTIALLY USED ON RIGHT OF WAY

Appendix E

Equipment Potentially used on ROW

Electric Line or Bucket Truck

Pole digger Truck

Gas Truck

All terrain pole truck

Backhoe

Track hoe

Side boom pipe layer

Bulldozer

Wheel Mounted Crane

Track Mounted Crane

Brown Brush Cutter

Radiarc Spray rig

ATV Spray Rig

Backpack Sprayer

Herbicides Pre-approved by NIPSCO Forestry Operations for Integrated Vegetation Management on Rights of Way

Herbicide	**Manufacturer**	**Active Ingredient**
Garlon 4	Dow AgroSciences	*triclopyr*
Garlon 3A	Dow AgroSciences	*triclopyr*
Rodeo	Dow AgroSciences	*glyphosate*
Accord	Dow AgroSciences	*glyphosate*
Escort	Du Pont	*metsulfuron methyl*
Krenite	Du Pont	*fosamine ammonium*
Krenite S	Du Pont	*Ammonium salt of Fosamine*
Aresenal	BASF	*Isopropylamine salt of Imazapyr*

APPENDIX F:

EXCERPT OF WISCONSIN PROTOCOL (PRESCRIBED BURNING)

Excerpt from

Wisconsin Karner Blue Butterfly
Habitat Conservation Plan and Environmental Impact Statement

Appendix F. Conservation Protocols and Guidelines for Karner Blue Butterflies

5. Management Tools and Techniques Considering the Karner Blue Butterfly

Prescribed Fire

Prescribed fire currently is the most widely used and accepted tool for barrens management, and may be considered for use on any Karner blue site, providing adherence to the requirements below.

Fire can have variable effects on community structure and composition, depending on the type and timing of the burn, the type of habitat being burned, and interactions with factors such as weather fluctuations (e.g., drought), soils, and other disturbance such as grazing.

Possible Outcomes of Fire Management

Positive

Prescribed fire may benefit Karner blue habitat in the following ways:

- Increased density, above-ground biomass, flowering, and seed production of wild lupine and possibly other legumes

- Increased seed germination and seedling establishment of wild lupine, depending on the timing of the burn, as well as that of other native annual and perennial plants including nectar plants and decreased time needed for lupine seeds to germinate

- Increased flowering of nectaring plants

- Possible benefits where competition from weedy species is minimal from nutrients available through increased subsurface microbial activity stimulated by warmer soil, and immediate nutrient availability in ash.

  [Generally nutrient availability from ash is believed to play a very minor role in grasslands, however on areas with very sterile soils such as many of the sands supporting wild lupine, the role may be more significant.]

- Higher nitrogen content in the plant tissue of lupines *(found in an Ohio study, however cause unknown--perhaps through fire's effects on nitrogen fixation)*

- Control and/or suppression of woody vegetation

- Control of Eurasian cool-season grasses to the favor of native warm-season grasses

  More study is needed on control of invasive vegetation --see "Reported Effects of Burn Timing" under "Timing of Burns," below.

Negative (or Neutral)

Fire is also known to have some negative effects, and the habitat benefits may be insufficient to justify its use. The timing of a prescribed fire may play a crucial role:

- *Heavy mortality of Karner blue eggs, larvae, pupae or adults present in burned area*

- Mortality of other invertebrates present in burned area (effects variable, depends on timing of burn as well)
- Heavy mortality of lupine seeds and seedlings present on or above the soil surface during a burn *(found in an Ohio study)*

- May not reduce woody encroachment by oaks, hazel, sweet fern, etc., and may even encourage brush through resprouting

- Increased drying of soils and hastened senescence of wild lupine so adequate foliage is possibly not available to second-generation larvae and ovipositing adults--applies generally to very dry sites and during drier-than-average years

- Removal of litter may increase exposure of developing eggs, larvae to heat, frost, predators, etc., and remove the micro-habitats occupied by certain animals thus reducing niche diversity

- Increased productivity of native warm-season grasses, especially from cool-season fires, which could be expected to eventually out-compete flowering plants

- May set back some flowering plants important for nectaring (varies with timing of burn)

- May lead to increased erosion, particularly of exposed, burnt soil

- Heavy machinery such as water trucks may cause soil compaction

The main benefits of fire are believed to stem from its role in reducing accumulated plant litter, exposing bare soil, promoting increased soil temperatures, and setting back growth of plants that compete with native, desirable vegetation. Some of these effects may be achieved or enhanced with alternative management tools alone, in combination, or alternatively with fire. Because some degree of Karner blue and other invertebrate mortality is to be expected from fire (mortality of Karners and some other invertebrates may indeed be very high), it should be used very cautiously, especially until further research and monitoring help elucidate the long-term costs and benefits of this tool.

Requirements

A. Number of burn units: Divide contiguous Karner blue breeding habitat into a minimum of *3 burn units* (more if feasible) for a small metapopulation near the minimum viable population size criteria. For metapopulations nearer the large viable size and inhabiting habitat over several square kilometers, swaths of habitat may be managed as single management units as long as occupied areas nearby can provide individuals to repopulate the management unit.

*["*Contiguous*" Karner blue breeding habitat is the total extent of an area supporting wild lupine (even if patchy and scattered) that is occupied by the Karner blue and uninterrupted by obvious barriers to adult butterfly dispersal (usually dense forest). Presume adults to be quite capable of dispersing* at least *300 meters over open areas of suitable habitat, and so include such areas as "contiguous".]*

Never burn an entire population at one time. S*ee Section IV-B above*. For each prescribed burn, leave at least 2 unburned units with an adequate firebreak between them to protect against wildfire or other chance events that may diminish below viable levels, the population on the untreated areas.

Where burn units are larger (i.e., greater than about 40 acres), maintain over the longterm an unburned refugium (a small portion of occupied lupine habitat) within the burn unit by alternative management such as appropriate mowing and herbicide use, or simply exclude an occupied lupine area during a fire for the short-term (by watering down an area prior to burning, for example). Such a measure will promote greater Karner population survival and facilitate post-burn Karner recolonization throughout the treated unit.

B. Rotation: Design burn rotations so that populations can rebuild numbers on burned areas before adjoining source colonies are burned. *For small metapopulations, leave at least 1 of the units adjacent to a burned unit in the condition of having been untreated for the previous 3 years.*

[Rebuilding the population for Karners appears to take at least 2 years, under favorable weather conditions*. Population buildup for other invertebrate species that complete only 1 generation per year presumably will take longer.*]

Annual monitoring of relative abundance both pre- and post-treatment will be necessary to determine average population levels and apparent recovery from treatment.

[Caution: Delay burning if populations decline severely due to weather or other factors (wildfires, flood, etc.)] Burn first the most degraded habitats supporting the fewest Karners, as habitat needs permit.

Recommendations

A. Burn Frequency: The optimal burn frequency per burn unit, with respect to the Karner blue, is no greater than once every 4 years, to allow populations ample time to recover through buildup from adjacent colonies. Burn frequencies of once every 5-10 years are preferred, unless woody succession or exotic invasion poses a more serious threat.

If sites are being burned more frequently than 4 years, consider alternatives. Substitute treatments such as mowing. Explore possibilities for excluding lupine colonies or patches which support the most Karners from burns (e.g., by burning around them). Maintain refugia within units through appropriate mechanical and/or herbicide management that leave significant portions of the population within a unit unharmed.

Burn Frequency for Metapopulations Occupying Large-Scale Barrens Landscapes. or large-scale sites where metapopulation management is underway, the ideal fire frequencies per local deme or subpopulation is no more than once every 5 years.

As always, monitor recolonization of burned areas and buildup of subpopulation levels before subsequent burning of same subpopulation.

B. Firebreaks: Utilize existing artificial or natural breaks such as trails, wetlands, or roads, as much as possible.

Avoid creating mineral breaks. While lupine may readily colonize the bare soil, so may other aggressive exotics. If mineral breaks are necessary to protect human safety, use rotovated or disced breaks rather than fire-plowed breaks. Caution must be used to avoid spreading seeds of weedy plants via equipment.

Monitor for potential invasion of aggressive exotic plants such as spotted knapweed or leafy spurge, and remove such invaders as soon as detected.
Contact the WI DNR's Bureau of Endangered Resources, 608/266-7012 to receive a copy of the "Draft Invasive Species Control Manual" for more information on control of weedy invaders. Be sure to follow pesticide use guidelines specific to the Karner blue *See "Pesticide Use," below.*

C. Type of Burn: Vary the degrees and intensities of burns. Allow or even aim for patchy burns, leaving a mosaic of burned and unburned areas whenever possible and compatible with overall needs of the habitat.

Consider leaving unburned a large lupine/barrens opening near the center of a management unit, to facilitate post-burn Karner blue recolonization throughout the unit, particularly for larger, more block-shaped units.

D. Timing of Burns: Fire is known to have different effects depending on when it occurs. To avoid selectively favoring some community components over others by repeated application of fire during the same time of year, vary the timing of prescribed burns to the extent weather permits.
[Since many of the invertebrate species inhabiting a grassland community probably overwinter in dormant life stages close to or in the soil and under snow compaction, early spring burns may have the least negative impact to the most invertebrate species, however more research is needed to acquire such life cycle information on invertebrate fauna .]

Reported Effects of Burn Timing

Dormant season burns (spring and late fall) typically are used to curb Eurasian cool-season grasses and increase native warm-season grasses (such as big and little bluestem) and summer-blooming native forbs. Late-spring burning when the cool-season grasses are in active growth, is by far the most effective time to burn to achieve these ends, followed by early spring burning. Fall burning is least effective for control of Eurasian cool-season grasses and encouragement of native summer grasses and forbs.

On much of the barrens and brush prairie habitat in Wisconsin, dormant-season burns have not appeared to curb encroaching scrubby oak or other woody brush, however. In fact, frequent fires on these areas may even stimulate denser brush thickets due to increased resprouting. Dormant-season burning also may stimulate sweet fern, which can exclude lupine and other prairie elements.

Many managers and observers have suggested that growing-season burns which could simulate naturally occurring lightning season burns, may set back woody growth much more effectively than dormant-season burns (documented research on this treatment is greatly needed). Growing-season burns also may favor flowering in some species not favored during spring or fall burns.

Summer burns would certainly have very different effects on the fauna present than would dormant season burns. Some invertebrate groups or species that overwinter as eggs or larvae on plants or in plant litter are vulnerable to spring and fall burning, but will be in a more resistant life stage during the summer. These species would be adversely affected or extirpated by repeated use of only dormant-season burning.

Karner blue adults are sedentary, and are weak fliers. They are expected to incur mortality from a summer burn; however, they have at least some physical ability to flee a fire and reproduce on adjacent lupine areas. Populations with eggs and larvae that are present on lupine between the two flight periods during a burn in June and July can be expected to be heavily impacted.

[*A study on two habitat sites at Necedah National Wildlife Refuge showed that some Karner blue adults survived fire treatment. However, proportions of survivorship varied widely with 86.7% observed on one site and 15.0% on the other site.* Much more research is needed in this area.]

Employ spring, summer, and fall burns to the extent possible, and as called for by the habitat condition and desired improvements. *Monitor and document the effects of variously timed burns on the overall community as well as on the relative abundance of Karner blues.*

Mechanical Management

As discussed above, many of the effects of fire on Karner blue habitat may be achieved through mechanical management. Historically, grazing and browsing by large ungulate herds (bison, elk, deer) undoubtedly played a significant interactive role with fire and climate in maintaining our prairie and barrens lands.

[Some long term butterfly monitoring conducted throughout the Midwest shows a much higher relative abundance and diversity of grassland-specialist butterflies on areas that are hayed, mowed or lightly grazed, or left untreated than on areas that are regularly burned.]

Mechanical management tools such as cutting, girdling, mowing, and bush-hogging may be used to simulate aspects of historical grazing and browsing and even to achieve many of the effects of fire, such as reducing litter accumulation (therefore reducing the fuel load for subsequent fire), opening ground for seed germination and seedling establishment, and curbing growth of competing woody and herbaceous plants.

Many of Wisconsin's Karner blue populations and other barrens-associated lepidoptera are found on power line and roadside rights-of-way, maintained solely by mechanical,and sometimes chemical, means.

[A large Karner population at an airport in New York is maintained solely by mowing however the habitat reportedly is quite artificial, and does not constitute a natural community].

The long-term effectiveness of mechanical management in creating and maintaining Karner blue habitat and overall barrens community habitat is unknown. Research in this area is badly needed.

Possible Outcomes of Mechanical Management

Positive

- *Expect significantly lower mortality of Karner blue and other invertebrate fauna* than that resulting from burn management, provided adherence to required guidelines outlined below.

- Removal or control of woody vegetation (may be more effective than fire for many woody species, especially combined with other disturbance techniques)

- Appears to maintain abundant lupine *(with proper timing; see "Mowing" guidelines, below)*

- Increased flowering of lupine and other nectaring plants *(with proper timing; see "Mowing" guidelines, below)*

- Increased seed germination and seedling establishment *(with proper timing; see "Mowing" guidelines, below)*

- Likely to involve soil disturbances that open ground for lupine and nectar plant colonization

- Reduces fuel load so subsequent fires are not as severe (clipped vegetation will decompose more rapidly than standing dead vegetation or "thatch")

- Greater niche diversity than in recently burned areas (duff and short vegetation remain)

- Less potential for erosion expected than on recently burned areas

Negative (or Neutral)

- Leaving clipped vegetation (which may contain Karner eggs) after mowing will reduce the effects produced by bare ground and increased soil temperatures compared to burning *(see "Mowing" guidelines, below)*

- Heavy machinery will disturb and compact soil, and may result in the invasion of exotics. Caution must be used to avoid spreading seeds of weedy plants via equipment as it moves from site to site.

- Waiting until early fall may reduce effectiveness in controlling or suppressing woody brush and will not control Eurasian cool-season grasses *(see "Mowing" guidelines, below)*

- Effects on lupine germination and seedling establishment are unknown

- Mowing during the growing season will negatively impact some plants and animals (like fire, this will vary with timing of treatment)

- Mowing in late summer before the end of August may remove necessary second flight nectar plants for Karner populations in some areas (e.g. roadside habitats within a forested landscape)

Because mechanical management is believed, at least in the short term, to result in lower mortality of Karner blues and other faunal components of the community than does prescribed fire, it should be strongly considered as an alternative or a complement to fire management. *Monitoring the results of mechanical management will be extremely important in helping to increase the knowledge base about its effects, both positive and negative, on Karner blue habitat.*

Mowing Requirements

A. Set blade height no lower than 6-8 inches to avoid the many eggs that will have been deposited on vegetation below that level. The blade may be set lower (4-6 inches) in portions of sites where lupine growth is held back by thatch or litter buildup and the Karner population on site is not at risk.

B. Mow no more frequently than once per year.

C. Divide occupied habitat into at least 2 units each of which supports lupine and nectar sources for adults during both flight periods. See "Expansion of Habitat through Plantings" below. Leave at least one management unit untreated each season.

D. Mow lupine areas no sooner than September 1, once all second-flight females have laid their eggs and died.

E. Let clipped vegetation remain where it falls, as it will likely contain eggs. Clippings may be collected and deposited in another site that supports lupine.

Recommendations

A. Timing: Optimal timing will vary according to habitat needs. Mowing after first frost will allow plants flowering in late summer to serve as nectar sources, complete their annual cycles and set seed. However, fall mowing will have little effect on Eurasian grasses and may have reduced effect on woody brush encroachment.

   Mowing from July through early August may be considered for occasional use, as this may be the best time for controlling woody vegetation (*Please document results!*). Do not mow all management units during this time, however, nor units at high risk of losing Karners due to low numbers or isolation.

   Unless justified by expected overall habitat benefits, do *not* mow lupine areas prior to seed set, the time when the pods have released the seed, which is usually completed by mid-July. If such early mowing is applied in a given year, refrain from mowing prior to lupine seed set for at least 2 subsequent years.

   [Caution: Deer and woodchuck herbivory on lupine, especially on the flowering stalks, can be severe. If this is a recurrent problem, use caution in mowing prior to lupine seed set, as lupine recruitment may already be very low.]

   Note the locations of lupine and nectar patches and consider addressing invasive plant management at separate times within each management unit, e.g. late June mowing of late season nectar areas.

B. If possible, use light equipment likely to have the least impact on the vegetation and Karner blue eggs.

C. If possible use a sickle mower operated from the roadside (non-lupine area), at least periodically, which will have less destructive impact on the vegetation and harbored eggs.

D. When brushing woody growth, if there is a lot of material, remove the slash from the cut area, put in piles no greater than 2 feet high, or chip it (so it doesn't cover lots of lupine. Minimize harm to the butterflies by cutting in the winter.

E. Tree or brush cutting, tree planting, and site scarification including rotovating, discing, and bulldozing are discussed in the "Forest Management Guidelines for the Karner Blue Butterfly" developed by Cynthia Lane at the University of Minnesota, St. Paul, MN. and available from the Service's Green Bay field office.